THE IRON TRADE REVIEW

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MARKED REVIVAL

IN BUILDING OPERATIONS—HEAVY INQUIRY FOR PLATES AND SHAPES.

Increased Demand for Tin Plate and Wire Products.—Pig Iron Active in the East.

Projected building operations, principally in the east, reflect improved financial conditions, and if only a portion of the plate and structural tonnage that is being figured on develops into orders, the active capacity in these lines will be considerably increased. A pipe line for a Long Island water project, requiring 20,000 tons of plates, will soon be up for consideration, and an addition to an eastern hotel will call for 4,000 tons of structural material. The Reading railroad will shortly ask for bids on 16,000 tons of steel for track elevation in Philadelphia, and the Corn Products Mfg. Co. will close for 4,200 tons next week for a plant to be erected in the Chicago district. Two thousand tons of steel will also be used in an addition to a Detroit warehouse. Miscellaneous structural orders include 1,700 tons for bridges at Milwaukee and Omaha. These projects are indicative of a marked revival in building operations which will indirectly affect many of the finished lines.

Prices Reaffirmed

At the conference of iron and steel manufacturers held in New York last week, a general feeling of optimism prevailed, and the ruling quotations on all commodities were reaffirmed. This action was not unexpected, in view of the increasing tonnage of finished materials, and is being well received by the trade. The tonnage booked by the Steel Corporation since Jan. 1 has shown a monthly increase of 25 per cent, and from present indications the same improvement will be shown this month. The Eastern Pig Iron Association has again decided to make no change in quotations, and additional stacks will be blown out if necessary, to maintain production and consumption on a level. Eastern bar iron interests, at a meeting held last week, also decided against a change of prices.

Tin Plate and Wire

Increased activity is noted in sheets, tin plate and wire products. The American Sheet & Tin Plate Co. is operating 83 of its 180 sheet mills, and 75 per cent of its tin plate capacity, as compared with 71 per cent a week ago. The tonnage booked by the leading wire interest thus far this month is only about 10 per cent less than that closed during the same period a year ago. Jobbers' stocks are reported low and insistent demands are being made for immediate shipments to meet spring requirements.

Pig Iron

Purchases by diversified foundry interests in the east have given the market more than accustomed acitvity in that section. An order for 4,000 tons of southern iron has been placed by a cast iron pipe plant, and one inquiry for 4,500 tons is pending. In the central west, concessions from the agreed price of $17 continue to be reported, and valley furnaces are quoting No. 2 foundry at $15.60. For early shipment, southern operators are asking $12 for No. 2, and are holding at $13 for second half.

Rail Sales

Rail sales include the New York Central order of 24,000 tons placed with the Lackawanna Steel Co. Rolling will start next month. The canal commission has bought 2,200 tons from a Baltimore concern, and scattered sales aggregate about 1,000 tons.

BIG INCREASE

IN OPEN-HEARTH STEEL PRODUCTION LAST YEAR.

Basic Steel Showed a Big Gain While the Output of Acid Steel Again Declined.

Statistics collected by the American Iron and Steel Association place the total production of open-hearth steel ingots and direct castings in the United States in 1907 at 11,549,088 gross tons, against 10,980,413 tons in 1906, an increase of 568,675 tons, or over 5.1 per cent.

The production was larger than in any preceding year, and was only 118,461 tons less than the production of 11,667,549 tons of Bessemer steel ingots and castings in the same year. The year of next largest production of open-hearth steel was 1906. When the collection of statictics of the production of crucible and miscellaneous steel ingots and castings is completed it will be found that the total production of all kinds of steel ingots and castings in this country in 1907 approximated 23,360,000 gross tons, as compared with an actual production in 1906 of 23,398,136 tons. The following tables gives the production of open-hearth steel ingots and castings by states since 1904, in gross tons:

States.	1905.	1906.	1907.
New England ...	239,282	251,047	239,797
N. Y. and N. J..	348,072	553,186	706,019
Pennsylvania	6,471,818	7,718,213	7,867,705
Illinois	617,625	884,472	1,013,251
Ohio	687,392	818,683	819,642
Other states.....	607,187	754,812	902,674
Total	8,971,376	10,980,413	11,549,088

Active Works.

The open-hearth steel made in 1907, including both ingots and castings, was produced by 136 works in 20 states and the District of Columbia. The District of Columbia appears among the producers for the first time. One hundred and twenty-five works in 20 states made open-hearth steel in 1906 and 111 works in 17 states made open-hearth steel in 1905.

Basic and Acid Steel.

In 1907 there were 10,279,315 tons of

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THE WEEK IN IRON CENTERS

PITTSBURG.

Active Capacity of Sheet and Tin Plate Mills Again Increased.

Office of THE IRON TRADE REVIEW,
510 Park Bldg., March 24.

An almost monotonous tone continues to characterize the iron and steel trade of the Pittsburg district. The past week has had little to offer as marked developments that might foreshadow the return of normal business conditions in the near future.

With but few exceptions, business is moving slowly. Spurts of life appearing and declining in various products, as the year advances, are giving to the general situation, a spasmodic condition that does not lend itself strongly to the maintenance of the confidence of the manufacturers in these lines of output.

But though the process of improvement is slow and gradual, general sentiment remains favorable and fully optimistic. There is no deceiving one's self upon the grave problems of the hour with their large fixed charges to be met and the maintenance of extensive plants upon a minimum basis, commensurate with the demands of the trade.

As far as the present month has gone, it has maintained its own over February and has recorded some gains. With more favorable weather conditions for the resumption of outdoor projects, April is expected by manufacturers to show a more apparent recovery. Reports from sales representatives of the mills, in various parts of the country are to this effect. With the mid-year passed and the presidential platforms and candidates determined, the movement toward a full volume of trade, is looked to be more rapid.

Reviewing immediate developments, tin plate, wire products and merchant pipe, to a moderate degree, continue to derive seasonable benefits and mill activities are increased. A slight gain is noted weekly in sheets. Other lines are practically stationary. The pig iron market is considerably unsettled.

An interesting feature of the past several weeks, has been the sudden increase in the demand for coal. Apprehension that an enforced cessation of mine activities might prevail shortly, by reason of labor disputes or the low ebb of industrial affairs in general, is believed to have prompted consumers to fortify themselves at this time.

Pig Iron.—A market of many prices, with increasing evidence of the willingness of some furnaces to disregard the Cleveland schedule of foundry iron quotations, is presented in pig iron. There remains but little doubt that $15.50, valley furnace, or $16.40 delivered Pittsburg, may be done on firm offers with particular furnaces, several sales upon this basis, being reported this week, but at the same time, there is a tendency displayed by some buyers to mis-state facts in regard to the analysis of iron purchased at this and lower figures. Some high sulphur iron has been taken by melters in this district, recently, at prices considerably under the regular market and reports of these as transactions of standard analysis iron, have been circulated with evident intent to depress the market. Sales of standard No. 2 iron are reported by sellers this week at $16.50 delivered Pittsburg, equivalent to $15.60 valley, on a lot of 100 tons from a furnace not in the valleys, and on a basis of $15.50 valley furnace, or $16.40 delivered Pittsburg, on 200 tons coming to the Pittsburg district. A broker's offer of $15.50 valley on a Pittsburg inquiry for 300 tons was refused by the melter this week. The open market on No. 2 foundry, remains $17 delivered Pittsburg, the official agreement price, and any decided concessions from this figure are being made under cover. Some interests are strictly adhering to the agreement price and are taking a little business. Inquiry for foundry iron in the Pittsburg district is very light but in New York state, more activity is noted, a Syracuse melter being in the market for 4,500 tons of northern No. 2, for delivery over the next six months, and a Rochester company asking quotations on 700 tons of southern No. 2 for second quarter and the last half. In malleable, we note the sale of 200 tons on the basis of about $16, valley. Solicitation has brought out about 5,000 tons in inquiries in malleable from New England consumers, three of these being for 1,000 tons each. Of the 3,000-ton inquiry for basis by an Ohio melter, reported last week, it is understood about 1,000 tons for April delivery was placed with Virginia furnaces at a shade under $17 delivered, Middletown. There are some other inquiries out for basic and the general quotation is $16 valley which is being shaded in some quarters. Bessemer is dull. The stocks of steel-making irons, in the valleys, were diminished by more than 4,000 tons in the week from March 14, to 21 and the total tonnage in furnace yards in that district is now about 68,000 of which 50,000 tons is considered sold on last year's contracts and is not available in the open market. Five furnaces out of 19, continue in blast in the valleys. The Clinton Iron & Steel Co. put in its stack in this city on foundry iron this week. We continue to quote the following prices on northern iron for either prompt or second quarter deliveries:

Bessemer, valley	$17.00 to 18.00
Bessemer, Pittsburg	17.90 to 18.90
No. 1 foundry, Pittsburg	17.00 to 17.50
No. 2 foundry, Pittsburg	16.50 to 17.00
Gray forge, Pittsburg	15.90 to 16.15
Basic, valley	16.00 to 17.00
Basic, Pittsburg	16.90 to 17.90

Ferro-Manganese.—A number of small inquiries have been in the market, and those which have developed in sales have shown lower prices. Carloads and slightly larger tonnages sold have been on a basis of about $45, delivered, Pittsburg. We note, however, the sale of a 25-ton lot to a local tin plate maker at about $46 Pittsburg, via Baltimore. Direct imported prices are lower. There is some interest in ferro-phosphorus, but it is reported that the domestic supply available in the near future is very limited. We quote 80 per cent ferro-manganese, for prompt delivery from European ports, at $45 to $46 Pittsburg.

Imported 50 per cent ferro-silicon is quoted $82 Pittsburg on forward deliveries; domestic 12 per cent, $29; 11 per cent, $28; 10 per cent, $27. The lower grades of imported ferro-silicon are quoted 50 cents lower. These quotations are applicable to Pittsburg territory.

Plates.—Nothing has developed in the past week to add to the strength of the plate market. Specifications are not heavy, as consumption by steel car and vessel-building interests is light, and in other lines tonnages under contract are not displaying much movement. There are several projects in sight which will require considerable plate material. We continue to quote:

Tank plate, ¼ inch thick, 6¼ to 100 inches, 1.70c f. o. b. mill Pittsburg. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c;

A. B. M. A. and ordinary fire-box steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive fire-box steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ¼ inch to and including 3/16-inch plate on thin edges, 0.10c; under 3/16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—The gradual improvement in the sheet trade, which has been manifested for a number of weeks, is continuing. The leading interest has in operation this week 46 per cent or 83 mills out of a possible total of 180 mills, as compared with 44 per cent or 79 mills last week. Some of the mills included in the grand total are not operated even in very prosperous times. The greater improvement in sheets is in the galvanized grades. The Youngstown Sheet & Tube Co. is operating its sheet mill again this week. We continue to quote:

Black steel sheets, one pass, cold rolled: Nos. 11-12, 2.10c; Nos. 13-14, 2.15c; Nos. 15-16, 2.20c; Nos. 17-21, 2.25c; Nos. 22-24, 2.30c; Nos. 25-26, 2.35c; No. 27, 2.40c; No. 28, 2.50c; No. 29, 2.60c; No. 30, 2.70c. Galvanized: Nos. 10-11, 2.45c; Nos. 12-14, 2.55c; Nos. 15-16, 2.65c; Nos. 17-21, 2.80c; Nos. 22-24, 2.95c; Nos. 25-26, 3.15c; No. 27, 3.35c; No 28, 3.55c; No. 29, 3.70c; No. 30, 3.95c. Blue annealed: Nos. 11-12, 1.85c; Nos. 13-14, 1.90c; Nos. 15-16, 2c. Corrugated roofing, $1.75 per square for No. 28 painted, 2½-inch corrugation, and $3.10 per square on galvanized roofing, 2½-inch corrugation, No. 28.

Tin Plate.—The tin plate trade continues the most consistently active of all iron and steel lines. Specifications and new orders continue to increase, much of this movement coming from the canning interests. The American Sheet & Tin Plate Co. put on 10 additional mills at its Sharon plant this week, making in operation 186 mills or 75 per cent of the 248 tin mills of the company, compared with 71 per cent last week. Independent mills are also working on a satisfactory basis. The Alcania Co. has started three mills at its plant at Avanmore, Pa., which had not been active since October, 1905. We quote: Coke tin plate, 100-pound basis, 14 x 20, $3.70 f. o. b. mill, Pittsburg district. Terms, 30 days, less 2 per cent for cash in 10 days.

Rails and Track Material.—Though negotiations are shaping themselves toward the closing of considerable tonnage of standard sections by the various railroad systems, no sales of this class are reported by the local maker this week. Light rail business taken aggregated 500 tons. Rerollers continue to shade schedule prices on light rails. Rail mills Nos. 1, 2 and 3 at the Edgar Thomson works are in operation, but their output is restricted. On present specifications on Bessemer rails, we quote as follows:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; 8-pound, $36; 12-pound, $32; 16-pound, $30; 20-pound, $29; 25 to 45-pound, $28; angle splice bars for standard sections, $1.65; standard spikes, $1.75 to $1.80 Pittsburg; hand spikes, $1.95 to $2.05 Pittsburg.

Steel.—Sheet and tin bars are moving actively, by reason of the improvement being maintained in tin plate, and the slight betterment in sheets. Billets are extremely quiet, and sales are few. We continue to quote $28 Pittsburg on Bessemer and open-hearth billets, and $29.50 on sheet and tin bars to Pittsburg, valley and Wheeling territory, and $29 Pittsburg for delivery to other points.

Hoops and Bands.—Only a moderate activity in hoops and bands is noticeable, and conditions are unchanged. Prices are firm. We continue to quote the following official prices:

Hoops in carload lots, 2c; in less than carload lots, 2.10c; bands, 1.60c; base half extras as per standard steel.

Merchant Bars.—Bars, both iron and steel, are in an unchanged state as respects specifications and new business, and the situation offers little satisfaction to manufacturers. Implement makers are specifying meagerly. The Eastern Bar Iron Association in a meeting last week re-affirmed the present price schedule, and nut and bolt makers also took similar action. There is some shading in steel specialties. We continue to quote:

Common iron bars, 1.50c Pittsburg in carload lots and over; 1.50c in less than carloads; 1.47c to 1.50c base Pittsburg plus freight to point of shipment on western deliveries; Bessemer steel bars, 1.60c; plow and cultivator, 1.60c; channels, angles, zees, tees, under 3 inches, 1.70c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 56 per cent in carloads, and 48 per cent in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. Planished and machine straightened tire steel is 1.80c base. Iron finished tire under 1½ by 1½ inches, 1.75c; iron finished tire, 1½ by ½ inches and over, 1.60c base. All tire subject to ½ extra on the steel card.

On cold rolled strip steel, widths 1½ inch and wider, we quote base prices per 100 pounds, $3.60 on hard and $3.75 on soft.

Structural Material.—As the open season advances, more repair and small contract business, is appearing but in general, structural lines have gained no strength. Very little work is coming from the railroads, as a rule, but the Pittsburg, Bessemer & Lake Erie has taken definite steps toward the development of its large bridge contract at Beaver, Pa., by taking bids on the sub-structure. The contract for the superstructure, which will require a large tonnage of steel, will probably not be awarded until late in the year. The award of the 7,000 tons of steel piling for the government work in Buffalo harbor, has not yet been made. Fabricating prices are still very low. We continue to quote:

Beams and channels, 15 inch and under, 1.70c; over 15 inches, 1.80c; zees, 1.70c; tees, 1.75c; angles from 3 to 6 inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.80c base.

Merchant Pipe.—Spring demands have put merchant pipe in a good position and jobbers with light stocks at hand with which to meet the increased call for goods, are urging quick shipment on their orders from the mills. There is some trade from the oil fields, but large projects are not many. The inquiry is out, however, for 20 miles of 3-inch pipe for southeastern Ohio oil field purposes. The closing of several other good-sized projects, has about been consummated. In gas line work, the inquiry is not up to expectations. Prices on both steel and wrought iron pipe are steady. Mill operations of the leading interest and principal independents range from 50 to 60 per cent and this is gradually being increased. We continue to quote the following official discounts of the principal maker, to consumers in large lots, with an additional one point and five off to jobbers:

	Black.	Galv.
⅛ and ¼ inch	65	49
⅜ inch	67	53
½ inch	69	57
¾ to 6 inches	73	63
7 to 12 inches	70	55
EXTRA STRONG PLAIN ENDS.		
⅛ to ⅜ inch	58	46
½ to 4 inches	65	53
4½ to 8 inches	61	49
DOUBLE EXTRA STRONG PLAIN ENDS.		
½ to 8 inches	54	43

Boiler Tubes.—The past week has been an especially good one in the orders booked for locomotive tubes, but this cannot be construed as a forerunner of more active railroad buying along general lines, because of the nature of the contracts. This activity, along with a greater volume of merchant pipe trade, has resulted in more furnaces being put in operation in the mills. Steel tube business is fair. Prices continue firm. We quote the following discounts:

	Iron.	Steel.
1 to 1½ inch	42	47
1¾ to 2¼ inch	42	59
2½ inch	47	61
2¾ to 5 inch	52	65
6 to 13 inch	42	59

2¼ inches and smaller, over 18 feet, 10 per cent net extra.
2¾ inches and larger, over 22 feet, 10 per cent net extra.

Wire Products.—Buying of wire products by the rural communities, is reflecting the substantial condition of the farmer. The volume of business being taken from week to week by the leading interest and other mills, remains large in comparison with other steel products, excepting only tin plate. The fencing trade is quite good. Prices are unchanged, and we quote:

Wire nails, jobbers carload lots, $2.05; retailers carload lots, $2.10; less than carloads, $2.15; painted barb wire, $2.20 for jobbers in carloads; retailers in carloads, $2.25; and less than carloads, $2.35, with 30c for galvanizing; plain wire, 1.90c for jobbers, and 1.95c by carload.

Rods.—Our nominal quotation on rods is $35 Pittsburg on Bessemer, and $36 Pittsburg on open-hearth.

Coke.—Beyond a slight increased interest in foundry coke for prompt shipment, the market offers little evidence of improved conditions. A marked increase in the demand for coal for steam purposes, due to an apprehension of curtailed operations in the mines, by reason of strikes or the general industrial depression, has caused operators in some districts to bank their ovens and offer their coal for fuel purposes. Production in the Connellsville region has been gradually increasing the past several weeks, the output for the week ending March 14, being 160,369 tons, against 158,824 tons the previous week. Prices are no firmer. For standard Connellsville, foundry coke for prompt shipment, we quote $2.25 to $2.50 ovens. Other grades are selling considerably under these figures. Our quotations on standard Connellsville furnace coke are from $1.70 to $1.80 ovens. Low phosphorus furnace coke is commanding $2 ovens and other grades are being offered under the quoted figures.

Old Material.—The market is in a stagnant state and practically no tonnage is being taken by the mills. Consumers are not interested in scrap at any price and the past week has been one of the quietest of the year for dealers. The embargo at the plant of the La Belle Iron Works, Steubenville, has been lifted. We quote the following nominal prices, gross tons, delivered in the Pittsburg district:

Heavy melting scrap, $12.75 to $13.25; rerolling rails, $14 to $14.25; bundled sheet scrap, $9.50 to $10; iron axles, $18.50 to $19.50; old iron rails, $15 to $16; No. 1 wrought scrap, $13.50 to $14; old car wheels, $15.50 to $16; low phosphorus scrap, $16 to $16.50; machine shop turnings, $8.50 to $9; cast borings, $7.75 to $8.25; No. 1 cast scrap, $14.75 to $15.25.

CHICAGO.

Heavy Demand for Wire Products—Pig Iron Quiet.

Office of THE IRON TRADE REVIEW,
1362 Monadnock Block, March 24.

One week of activity seems to exhaust the vitality of the market, and following the interest reported a week ago this review covers a week of comparatively few transactions. Inquiry for pig iron was good, but actual sales were limited. The demand for sheets and wire products is unabated, but interest in structural material fell off disappointingly from expectations. The closing of contracts, amounting to 1,500 tons, for two bridges is noted and also 675 tons for the Idaho capitol building. The railroads have been large buyers of spikes this month and further purchases are anticipated. It is also gratifying to note that despite the erratic character of buying the local mills of the Corporation now have active orders on their books aggregating two-thirds of the amount carried in March of last year. Demand for billets and plates is at a minimum. Cast iron pipe continues to gather in a limited tonnage but there is little profit at the prices that are being made. The scrap market is decidedly weak and without interest. Those who are unhampered by financial troubles and are in a position to take advantage of whatever improvement may develop in business are looking upon the situation with an increasing degree of hopefulness but it is very apparent that all are not so fortunately situated.

Freight Rates. — The following freight rates are in force on iron and steel products delivered at Chicago: On pig iron, per ton, from the valley, $2.40; from Pittsburg, $2.80; from Birmingham, $4.35; from Michigan points for charcoal iron, $1.50; from Virginia, $3.20. On billets and rods, per ton, from Pittsburg, $3. On iron and steel, merchant bars, structural steel, plates, rails and wire products, 18 cents per 100 pounds, for carload lots and 21 cents for less than carload lots. On coke, from Connellsville, $2.65.

Pig Iron.—The most favorable indication of the week as regards pig iron was the increase of inquiry for future delivery iron. This inquiry covered a very considerable tonnage but was for the most part no more than a testing of the market. It has sufficed at least, to show that southern furnaces will not take orders for last half delivery for less than $13. Northern iron for the same delivery can hardly be obtained for less than $18. These prices also do not exceed by very much what is being asked for spot iron. Prompt shipment iron from the south can be bought freely at $12 to $12.50. Sales of iron have been few and of small tonnage. We quote for prompt shipment as follows, Chicago delivery:

Lake Superior Charcoal	$21.50 to 22.00
Northern Foundry No. 1	17.85 to 18.35
Northern Foundry No. 2	17.35 to 17.85
Northern Foundry No. 3	16.85 to 17.35
Southern Foundry No. 1	16.85 to 17.35
Southern Foundry No. 2	16.85
Southern Foundry No. 3	16.35 to 16.85
Southern Foundry No. 4	15.85 to 16.35
Southern No. 1 Soft	17.35 to 17.85
Southern No. 2 Soft	16.85 to 17.35
Southern Gray Forge	15.35 to 15.85
Southern Mottled	15.10 to 15.60
Southern Silveries, 4 per cent Silicon	18.85 to 19.35
Southern Silveries, 5 per cent Silicon	19.35 to 19.85
Southern Silveries, 6 per cent Silicon	20.35 to 20.85
Jackson Co. Silveries, 6 per cent	21.90 to 22.40
Jackson Co. Silveries, 8 per cent	23.90 to 24.40
Jackson Co. Silveries, 10 per cent	25.90 to 26.40
Malleable Bessemer	18.00 to 18.50
Standard Bessemer	19.40 to 19.90
Alabama Basic	17.35 to 17.85

Billets and Rods.—The demand for billets in this territory is almost nil. The car axle billets for the Chicago, Milwaukee & St. Paul railroad mentioned last week is apparently the only prospective item of interest. The buying of rods is occasional in character and in small quantities. We quote for Chicago delivery, rolling billets, $31; forging billets, $33. We quote f. o. b. Pittsburg, Bessemer wire rods, $35; open-hearth rods, $36; chain rods, $37.

Merchant Bars.—Bar iron mills report some favorable indications with a slight increase in the volume of specifications as shown by a more continu-

ous operation of the mills. The month of March will undoubtedly show a larger tonnage output than did February, though the increase will be small and there remains a great deal to be gained. Inquiry for steel bars is fair and specifying is more active than earlier in the year. The total volume of merchant material being consumed is very small but buying in small lots assumes at times a certain character of briskness.

Bar iron, 1.65c to 1.68c; soft steel bars and bands, 1.78c, half extras; soft steel angles, less than 3 x 3, 1.88c; hoops, 2.18c base, full extras; planished or smooth finished tire steel, 1.98c; iron finish, up to 1½ x ½ inch, 1.93c base tin card; iron finish 1½ to 1½ inch and larger, 1.78c base, steel card; channel for solid rubber tire, ¾ to 1 inch, 2.28c, and 1⅛ inch and larger, 2.18c; smooth finished machinery steel, 2.18c; flat sleigh shoe, 1.83c; concave and convex sleigh shoe, 1.93c; cutter shoe, 2.36⅛c; toe calk steel, 2.33c; railway spring, 1.98c; crucible tool steel, 7c to 9c, with higher prices asked on special grades. Quotations on shafting are 54 per cent off the list for carload lots, and 48 per cent off for less than carload lots. On iron and steel bars from local stocks, we quote as follows: Bar iron, 2.10c, full extras; soft steel bars, $2 per 100 pounds base, plus half extras; soft steel hoops 2.40c; full extras.

Plates.—While some small orders for plates are continually being placed and enough so that the principal producer will probably start up one plate mill at South Chicago next week for a short run, the general situation is decidedly inactive. We quote:

Plates, ¼-inch and heavier, 6¼ to 100 inches wide, either universal or sheared, 1.88c to 1.91c Chicago. For extras see Pittsburg report. Jobbers' prices for shipment from local stocks are as follows: Tank steel, ¼-inch and heavier, up to 72 inches wide, 2.10c to 2.20c; from 72 to 96 inches wide, 2.20c to 2.30c; 3/16-inch up to and including 60 inches wide, 2.20c to 2.25c; 72 inches wide, 2.45c to 2.55c. No. 8 up to 60 inches wide, 2.20c to 2.25c. Flange and head quality, 25c extra.

Sheets. — The active demand for sheets continues. Galvanized and black are moving without decided difference. The Inland Steel Co. is operating practically up to capacity. It is reported that the buying of sheets for building construction bids fair to increase steadily for some time to come, as the estimates now being figured on are surprisingly numerous. Prices appear to be firmly maintained and sales are made without any difficulty at the quoted figures. We quote for Chicago delivery from store, as follows:

No. 10, 2.20c to 2.25c; No. 12, 2.25c to 2.30c; No. 14, 2.30c to 2.35c; No. 16, 2.40c to 2.50c; Nos. 18-20, 2.60c to 2.65c; Nos. 22-24, 2.65c to 2.70c; No. 26, 2.70c to 2.75c; No. 27, 2.75c to 2.80c; No. 28, 2.85c to 2.95c; No. 30, 3.25c. Galvanized sheets, Nos. 10 to 16, 3.05c to 3.15c; Nos. 18 to 20, 3.15c to 3.25c; Nos. 22 to 24, 3.30c to 3.35c; No. 26, 3.50c to 3.55c; No. 27, 3.70c to 3.75c; No. 28, 3.90c to 4.00c; No. 30, 4.40c to 4.50c.

Structural Steel.—Figures show that with over 20,000 tons of live operating orders on its books, the principal producer in this market has two-thirds as much business as it had this time last year. This is an unexpectedly good showing and includes structural steel, rails and plates. The week just past was more quiet in the matter of building steel contracted for than the week preceding, and a number of projects that it was expected would be closed have been postponed. The contract for building the Kinnikinnic avenue bascule bridge in Milwaukee was awarded to Arthur Vogel, contractor, and the steel will be furnished by the Worden-Allen Co. The tonnage amounts to 961 tons and the price is about $55,000. The Pennsylvania Steel Co. will furnish 800 tons of bridge structurals for a railroad bridge at Omaha, used by the Union Pacific railroad. The Minneapolis Steel & Machinery Co. will fabricate the steel for the addition to the capitol at Boise, Idaho. The amount required will be 675 tons. The Corn Products Mfg. Co. will let the contract for part of its new buildings about April 1. This will mean about 11 of the largest buildings, leaving some eight or nine more to be built later. The tonnage which will be placed now aggregates 4,200 tons and will doubtless go to the leading interest. While the drawings and design are not entirely completed the steel will be bought on a tonnage basis. We quote mill prices for plain structurals as follows:

Beams and channels, 3 to 15 inches inclusive, 1.88c to 1.91c delivered Chicago. For extras see Pittsburg report. Quotations from store are as follows for carload lots and over:

All angles, 3 inches and larger, including 6 inches, $2.05 per 100 pounds; angles, over 6 inches, $2.15 per 100 pounds base; beams, 3 to 15 inches inclusive, $2.05 per 100 pounds base; channels, 3 inches and larger, $2.05 per 100 pounds base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—The Illinois Steel Co. estimates its total sales of spikes for this month at about 70,000 kegs, and one road is now figuring on its season's requirements. There is no interest in rails on the part of the large roads but the smaller lines out through the west are inquiring quite freely and buying in small tonnages. The Pennsylvania Steel Co. sold last week 400 tons of girder and high T-rails and also an aggregate of 1,000 tons of tie plates to the local street railway systems. We quote as follows:

Standard rails, $28 f. o. b. mill, full freight to destination; light rails, 25-pound to 45-pound, $28; 20-pound, $29; 16-pound, $30; 12-pound, $31. Track supplies, f. o. b. Joliet, angle bars, 1.65c; spikes, 1.85c to 1.95c; track bolts, with square nuts, 2.35c to 2.45c; with hexagon nuts, 2.50c to 2.60c. Small railroad and square boat spikes, 2c base, f. o. b. Pittsburg.

Merchant Pipe and Boiler Tubes.—The tubular business progresses entirely without transactions of note. The general volume of inquiry and orders increases slowly but perceptibly as the months are compared, but the buying is of a routine nature and does not indicate the undertaking of any projects that might be considered as having an influence on the market.

We quote mill discounts, Chicago delivery, carload lots, as below. On steel pipe jobbers are allowed a concession of one point and 5 per cent additional from the schedule in force:

	—Steel— Black.	Galv.
¼ to 6 inches, inclusive....	71.2	61.2

BOILER TUBES.

	Steel.	Iron.	Seamless.
2¼ to 5 ins., inclusive..	63.2	50.2	49.2

Mill quotations on iron pipe are five points higher than the foregoing prices.

We have revised our prices from store, as below. A concession of one-half to one point from these prices is allowed by Chicago jobbers on carload orders shipped from local stocks. We quote for less than carload lots as follows:

MERCHANT PIPE.

	Black.	Galv.
⅛ to ¼ inch.....	64	48
⅜ inch	66	52
½ inch	68	56
¾ to 6 inches	72.5	62
7 to 12 inches.....	68	53

Store prices for wrought iron pipe, carload lots, from Chicago stocks, are as follows: One-eighth to ¼-inch, 59; ⅜-inch, 61; ½-inch, 63; ¾-inch to 6 inches, 68; 7 inches to 12 inches, 65.

Boiler tubes from store are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ inches.....	35	35	35
1¼ to 2¼ inches.....	50	35	35
2½ inches	52½	35	35
2¾ to 5 inches.....	60	47½	47½
6 inches and larger....	50	35	..

Cast Iron Pipe.—The letting for 2,000 tons at Cincinnati, advertised for last week, has been postponed, and will come up again some time in April. The letting of the contract for 1,200 tons of 36 and 42-inch pipe for Evanston, Ill., which was delayed somewhat after bids were received, has been awarded to the Massillon Iron & Steel Co. A few other lettings were placed, among them 200 tons for Saginaw, Mich. Prices remain unchanged although the buying of pipe is somewhat more backward and diminished in volume than might reasonably be expected. We quote: 4-inch pipe, $30; 6 to 12-inch pipe, $29; larger sizes, $28; gas pipe, $1 a ton higher.

Wire Products.—With the exception of the manufacturing trade which reduces the general average of activity it is estimated that the demand for wire products is fully 90 per cent of what it was a year ago. The Joliet and Waukegan mills of the leading producer are operating almost to full capacity. The mills are well supplied with stocks and prompt shipments are being made. Dealers' stocks are so low that this has proven a very fortunate circumstance. Some of the mills of the American Steel & Wire Co., in the central territory, are being less fully operated but will undoubtedly not be much further reduced as certain products are turned out there that are not made elsewhere. Prices are without change, and we quote to jobbers for Chicago delivery as follows:

Wire nails, $2.23; painted barb wire, $2.38; galvanized barb wire, $2.68; smooth annealed wire, $2.08; smooth galvanized wire, $2.38; polished staples, $2.23; galvanized staples, $2.63. Carload lots to retailers, 5 cents higher; less than carload lots, 15 cents higher.

Coke.—The coke market is extremely quiet. Foundries are buying in carload lots and wherever they can obtain the best prices. We quote, for standard Connellsville coke, $2.25, and for furnace coke, $1.75, at the ovens.

Old Material.—One may almost say there is no buying of scrap by consuming interests. Dealers are manipulating their stocks in a more or less feeble way but buyers have pretty nearly prohibitive ideas in the direction of low prices and are without any interest in the market. The Chicago, Burlington & Quincy is offering a list of 4,800 tons of scrap, including 1,000 tons of old iron rails. We have revised our prices and quote gross tons in the first paragraph as follows:

Old car wheels	$15.75 to 16.25
Old iron rails	15.25 to 15.75
Re-rolling rails (3 ft. and over)	12.00 to 12.50
Old steel rails (3 ft. and under)	12.25 to 12.75
Light section relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	19.00 to 19.50
Frogs, switches and guards	11.50 to 12.00
Heavy melting steel	11.50 to 12.00

We quote, net tons, as follows:

No. 1 R. R. wrought	$11.00 to 11.50
No. 2 R. R. wrought	10.00 to 10.50
Knuckles, couplers and springs	10.75 to 11.25
Shafting	13.50 to 14.00
Iron car axles	16.00 to 16.50
Steel car axles	15.00 to 15.50
Dealers' forge No. 1	9.00 to 9.50
Pipes and flues	8.50 to 9.00
No. 1 cast, 150 lbs and less	12.00 to 12.50
No. 1 mill	8.00 to 8.50
Mixed busheling (Nos. 1 and 2)	7.25 to 7.75
Country sheet	5.25 to 5.75
No. 1 boiler cut	7.00 to 7.50
Boiler punchings	10.00 to 10.50
Cast borings	4.75 to 5.25
Mixed borings, etc	4.75 to 5.25
Machine shop turnings	6.50 to 7.00
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.50 to 10.00
Stove plate and light cast scrap	10.00 to 10.50
Old iron splice bars	14.00 to 14.50

CLEVELAND.

Lake Ore Shipments Deferred—Pig Iron Quiet.

Office of THE IRON TRADE REVIEW,
Browning Building, March 24.

Iron Ore.—From present indications, it is doubtful if the first shipment of ore from upper lake ports will be made before June 1. Ore shippers have not even discussed the opening of navigation, although all are of the opinion that it should be deferred almost into the summer months. No purchases of ore have been made during the week, but it is estimated that furnaces depending upon the Lake Superior mines for their requirements have sufficient ore on hand and at lower lake ports to operate their plants at their full capacities until Sept. 1. Vessel capacity to move about 50,000 tons of steel rails from Lake Erie ports to the head of Lake Superior has been chartered. The boats will receive about 80 cents a ton, which is the same rate as was paid last season. The rails are to be delivered to the Great Northern Railroad Co. The boats are small carriers, and are owned at Cleveland, Buffalo and Detroit. On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51.50 per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range, Bessemer, $5; Mesabi Bessemer, $4.75; old range non-Bessemer, $4.20 and Mesabi non-Bessemer, $4.

Pig Iron.—Transactions continue to be limited to small lots for immediate consumption only. All of the large producers are adhering to agreed prices, although several furnace operators are making concessions of 50 to 75 cents a ton. One large interest, whose normal inquiry for pig iron averages from 35,000 to 40,000 tons a month, reports that at the present time, quotations on less than 1,500 tons in this period are asked for. We quote, Cleveland delivery, charcoal iron being based on water freight rates, as follows:

Bessemer	$17.90 to 18.90
No. 1 foundry	17.85
No. 2 foundry	17.35
No. 3 foundry	16.85
No. 2 southern	16.85 to 17.35
Gray forge	16.00 to 16.85
Lake Superior charcoal	22.00 to 23.00

Coke.—Quotations on coke continue to decline, and while one sale of furnace coke has been reported at $1.60 at the ovens, the prevailing quotation is $1.75. High grade spot foundry coke can be had as low as $2.25, although several operators are asking $2.50.

Finished Material. — Five hundred tons of slabs were sold in this market last week at a price that is said to have netted the producer less than $28 a ton Pittsburg. It is reported that both Bessemer and open-hearth steel in the unfinished form is being freely offered at concessions from the agreed basis. The demand for both iron and steel bars continues light, although prices are being well maintained. Jobbers report a slight improvement in sales from stock, and with the opening of the building season, a big increase in the sales of such finished lines as sheets, pipe and tin plate is anticipated.

Old Material.—The market continues to show stagnation and little real movement of material is noted in this district. The local mills are working several days a week but are taking little apparent interest in the old material market. The offerings of the railroads seem to have weakened the cast material, it dropping 50 cents a ton the past week. Some smaller quantities of cast material have been moved down state through the Cleveland market. The quotations have been slightly changed, as follows, largely nominal, f. o. b., Cleveland:

Old iron rails	15.50 to 16.00
Old steel rails (re-rolling)	13.00 to 13.50
Old steel rails (under 6 feet)	12.25 to 13.25
Old car wheels	16.00 to 16.50
Old steel boiler plate	9.25 to 10.25
Steel axles	14.50 to 15.00
Malleable iron (railroad)	12.25 to 13.25
Malleable iron (agricultural)	10.25 to 11.25
Heavy steel	11.25 to 12.25
Country mixed steel	11.00 to 12.00
Low phosphorus	14.75 to 15.50

We quote, net tons, as follows:

No. 1 R. R. Wrought	11.25 to 12.25
No. 1 busheling	10.00 to 10.50
No. 1 machine cast	12.00 to 12.50
Iron axles	16.00 to 17.00
Axle turnings	7.00 to 7.50
Machine shop turnings	6.00 to 6.50
Grate bars	9.25 to 10.25
Pipes and flues	10.00 to 11.00
Tank iron	8.25 to 9.25
Hoop and band iron	5.25 to 6.25
Sheet iron	4.25 to 5.25
Wrought drillings	6.00 to 6.50
Stove plate	10.25 to 11.25
Cast borings	4.75 to 5.75

NEW YORK.

More Activity in Pig Iron—Large Orders for Plates Pending.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., March 24.

Pig Iron.—Purchases by pump, stove and pipe manufacturers during the past week have given the local market somewhat more than its accustomed activity, and selling interests generally find March business averaging from 20 to 25 per cent better than that of February. This does not necessarily imply a corresponding increase in the foundry melt, however, as it may indicate merely that stocks have reached such a low stage as to demand replenishing. An encouraging feature is the appearance of a few inquiries of considerable size for deliveries running in some cases through the summer, though it is not yet certain that these are anything more than market feelers. It is known for a certainty, however, that stocks in furnace yards throughout this district are not increasing, having remained practically stationary since the beginning of the year. One well informed iron man estimates that furnaces now have about 100,000 tons on hand throughout this section. Both at the Philadelphia meeting of the Eastern Pig Iron Association and the New York conference of iron and steel interests, it is stated, the general feeling was entirely optimistic and no change in prices was deemed wise. Outsiders, however, are taking the bulk of current business and low prices prevailed on all attractive tonnages closed during the week, southern iron going as low as $12, Birmingham, and Virginia at $14, at the furnace. The largest sale reported was 3,000 tons, distributed among several furnaces. The 4,500 inquiry is still pending. The British market continues to advance and only a recent rise in ocean freight rates is preventing the beginning of an export movement from the south. We quote, tidewater delivery, as follows:

Northern foundry No. 1	$18.50 to 19.00
No. 2X foundry	18.00 to 18.50
No. 2 plain	17.50 to 18.00
No. 2 southern foundry	17.50 to 17.75
Malleable	17.75 to 18.25
Basic	17.00 to 17.50
Gray forge	16.50 to 17.00

Ferro-Manganese.—There is a plentiful number of small inquiries and occasionally one of some tonnage, but the market level is still low, being in the neighborhood of $43, seaboard.

Finished Materials.—

Structural projects are being held up to a surprising extent and no large lettings have developed in this district during the week. The Hotel Astor addition, involving 4,000 tons of steel, will be up within a few weeks. The letting of contracts with the American Locomotive Co. for 135 locomotives for the New York Central system, emphasizes the increasing ease with which railroads are securing funds. Steel corporation activities continue upward though still but slightly in excess of 50 per cent. The reaffirmation of prices at the meeting of iron and steel committees in this city last week was not unexpected and is being well received. It develops that because of complications arising from the rearrangement of railway connecting facilities, the Gary plant will hardly be producing steel before the end of the year, though the original intention was to begin operations of certain units by late summer.

Prices were reaffirmed at last week's meeting of bar iron interests in this city, and there appears to be a very decided intention to stand by this action, although a price as low as 1.30c, Pittsburg, has since been made, presumably by brokers. Mills are operating in the neighborhood of 40 per cent. Plate prices are being well maintained. The Lukens Iron & Steel Co. has taken the 2,000 tons for export to Newfoundland. Interest centers in the Long Island water project, requiring some 20,000 tons of plates for a large pipe line, specifications on which will be ready in two or three weeks. There is the usual grist of small cast iron pipe contracts, but no large lettings are reported. Business is being taken at about $22.50 per ton at the foundry, though this price can be shaded on large sizes. We quote: Angles, 3 to 6 inches x ¼ inch and heavier, 1.86c; beams, 3 to 15 inches, 1.86c; tees, 3 x ¼ inch and heavier, 1.91c; plates, carloads, tanks, 1.86c; marine boilers, 2.26c; bar iron, 1.56c; soft steel bars, 1.76c; sheets, No. 28, black, 2.66c.

Old Materials.—There has been some little activity in heavy melting steel, with sales of sizable tonnages, but other lines are extremely quiet and the price tendency is downward. We quote, New York prices on gross tons, as follows.

Old iron rails	$15.50 to 16.00
Old steel rails, re-rolling	14.50 to 15.00
Relaying rails	20.00 to 21.00
Old car wheels	14.00 to 14.50
Old iron car axles	17.00 to 17.50
Old steel car axles	15.50 to 16.00
Heavy melting steel	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
Iron track scrap	11.50 to 12.00
Wrought pipe	9.00 to 9.50
Cast borings	5.00 to 5.50
Wrought turnings	7.50 to 8.00
Heavy cast scrap	13.50 to 14.00
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.00 to 10.50
Stove plate	10.00 to 10.50
Grate bars	9.50 to 10.00

CINCINNATI.

No Increase in Southern Pig Iron Producing Capacity.

Office of THE IRON TRADE REVIEW, First National Bank Bldg., March 24.

Pig Iron.—Market conditions continue dull and without material change. We learn of no large inquiries and small order business is limited. The market appears lifeless with southern iron quoted at $12 to $12.50, Birmingham, and northern iron at $16 at furnace. High silicon iron, 8 per cent, remains at $19, furnace. The general feeling in the trade is that the market is weak at these quotations, and it is not unlikely that a good inquiry might produce shaded prices to secure the order. A local consumer is inquiring for 500 tons of No. 3 foundry, and as far as could be learned the business pending last week has not been closed. On Dec. 1, last year, in this letter we presented a list of the furnaces in the southern zone in and out of blast and found at that time 21 stacks were in blast and 34 out, exclusive of the four Tennessee Coal, Iron & Railroad Co.'s furnaces at Ensley, which are still on basic. The list today is as follows: Rockwood, one in, one out; Dayton, one in, one out; Citico, none in, one out; Sheffield, none in, three out; Chattanooga, none in, one out; Rockdale, one in, none out; Woodstock, one in, one out; Woodward, two in, one out; Tennessee Coal, Iron & Railroad Co., one in, 10 out; Republic Iron & Steel Co., two in, one out; Sloss, four in, three out; Trussville, none in, one out; Rising Fawn, none in, one out; Embreeville, none in, one out; Warner, one in, none out; Alabama Consolidated, two in, two out; Napier, one in, none out; Alabama City, none in, one out; Tuscaloosa, one in, none out; Williamson, none in, one out; Rome, none in, one out; Vanderbilt, one in, one out; Bon Air, one in, one out; Clarksville, none in, one out; Standard, none in, one out. This makes a total of 20 stacks in blast and 35 idle, or one stack less in operation now than on Dec. 1, showing that southern production has not materially changed in the past four months. We quote for prompt shipment and second quarter delivery, delivered Cincinnati, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, as follows:

	PER TON
Southern foundry No. 1	$15.75 to 16.25
Southern foundry No. 2	15.25 to 15.75
Southern foundry No. 3	14.75 to 15.25
Southern foundry No. 4	14.25 to 14.75
Southern No. 1 soft	15.75 to 16.25
Southern No. 2 soft	15.25 to 15.75
Southern gray forge	13.50 to 13.75
Northern No. 1 foundry	17.70 to 18.70
Northern No. 2 foundry	17.20 to 18.20
Northern No. 3 foundry	16.70 to 17.70
Northern 8 per cent silicon	20.20 to 21.20

Finished Material.—Trade continues quiet with specifications on contracts moderate and business from the stores for material out of stock just fair. Less than carload orders are filled here at the following prices:

Bar iron, 1.75c; steel bars, 1.85c, one-half extras. In some instances, retailers are still asking 2.10c, full extras, from store on small lots for both iron and steel. Angles, 3 x 3 and over, 2.15c to 2.25c; beams and channels, 15 inches and under, 2.15c; small angles and architectural channels, 2c base; plates, ¼-inch and heavier, 2c; 3/16-inch, 2.10c; No. 8, 2.15c; sheets (blue annealed) No. 10, 2.25c; No. 12, 2.30c; No. 14, 2.35c; No. 16, 2.45c; box annealed sheets, Nos. 18 and 20, 2.65c; Nos. 22 and 24, 2.75c; Nos. 25 and 26, 2.80c; No. 27, 2.85c, and No. 28, 2.95c; boiler tubes, 62 per cent off base; turnbuckles, 45 per cent off; rivets, 3.15c base; cold rolled shafting, 50 per cent off list; steel tire, 2.05 base.

Coke.—The market is quiet and unchanged. The calls for coke on contracts are still limited, but show no decrease as compared with the past two or three weeks. Furnace coke is dull. Prices in the leading coke producing districts are as follows:

Wise county furnace coke	$1.75 to 2.00
Wise county foundry coke	2.25 to 2.50
Pocahontas furnace coke, prompt shipment	1.65 to 1.90
Pocahontas foundry coke	2.25 to 2.40
Connellsville furnace coke, prompt shipment	1.75 to 2.00
Connellsville foundry coke	2.25 to 2.50

Old Material.—The market is quiet with an easy undertone, and melters taking but little on contract and not inquiring for much. Recent quotations remain unchanged, with dealers' prices here as follows:

Old No. 1 R. R. wrought, net tons	$12.00 to 12.50
Cast machine and fdy., net tons	12.50 to 13.50
Old iron rails, gross tons	16.50 to 17.50
Old steel rails (re-rolling) gross tons	12.50 to 13.50
Old short lengths, gross tons	12.50 to 13.50
Old iron axles, net tons	16.50 to 17.50
Heavy melting scrap, gross tons	13.00 to 14.00
Stove plate, net tons	10.50 to 11.50
Wrought turnings	5.50 to 6.50
Cast borings, net tons	4.50 to 5.50
Car wheels, gross tons	16.50 to 17.50

Charles Child Wheeler, broker in pig iron warrants and certificates of New York, was a caller among the pig iron and foundrymen in Cincinnati this week. Mr. Wheeler and the chairman of the contract committee of the Iron Buyers' Association, with a representative of one of the furnace companies, held a conference on the subject of dealing in pig iron warrants and certificates, and it is likely that something may result in the way of a campaign of education, which will give buyers of pig iron a more detailed knowledge as to how the pig iron warrant and certificate system may be used by them to advantage.

PHILADELPHIA.

Pipe Foundry Places Large Order for Pig Iron.

March 24.

Pig Iron.—There is no material change from the quiet conditions that have ruled for some time. The most striking event has been an order for 4,000 tons of foundry iron from a pipe founder in New Jersey that went to a southern interest at prices reported to be a little under those fixed for this territory. Prices are, however, fairly well maintained, and at a meeting of the Eastern Pig Iron Association last week it was agreed that there was no occasion for any change. The orders on hand were reported to be substantially the same in amount as those of a month ago, and the stocks on hand showed little increase. General determination to keep supplies down to actual requirements was expressed, and in pursuance of this policy still more furnaces may be blown out. The extent to which this curtailment is carried may be judged from the fact that some large companies owning from eight to 10 furnaces, which have blown out all except two, are seriously contemplating taking one of these out of operation. A hopeful feeling was expressed at the meeting, though it was admitted that there had been some shading of prices. The amount of iron so sold is small, however, and for standard irons the prices remain unchanged, as follows:

No. 1X foundry	$18.75 to 19.25
No. 2X foundry	18.25 to 18.50
No. 2 plain	17.75 to 18.00
Standard gray forge	16.50 to 16.75
Basic	17.25 to 17.50
Low phosphorus	23.50 to 24.00

Finished Material.—Some mills report a slight improvement, but this is not general, though there is undoubtedly a better feeling since the excellent showing of the United States Steel Corporation's report. Much interest is taken in the announcement that bids will soon be invited for 16,000 tons of structural material to be used in the elevation of the Reading railway's tracks in this city. This business, if secured by local interests, will insure steady work for a long time. Prices are firmly maintained, as follows: Structural material, 1.85c to 2c, according to specification; plates, 1.85c to 1.90c; steel bars, 1.75c to 1.80c; refined iron bars, 1.65c.

Old Material.—Prices are on the decline again because of the almost complete absence of orders from the mills, steel scrap seeming especially weak. No immediate improvement is looked for. Prices may be quoted as follows:

Old steel rails	$14.75 to 15.25
No. 1 steel scrap	12.75 to 13.25
Old steel axles	18.00 to 18.50
Old iron axles	20.50 to 21.50
Old iron rails	17.00 to 17.50
Old car wheels	16.00 to 16.50
Choice scrap R. R. No. 1 wrought	14.50 to 15.00
No. 1 yard scrap	13.50 to 14.00
Machinery scrap	15.00 to 15.50
Low Phosphorus scrap	**18.00 to 18.50**
Wrought iron pipe	12.00 to 12.50
No. 1 forge fire scrap	10.50 to 11.00
No. 2 forge fire scrap, ordinary	9.00 to 9.50
Wrought turnings	9.50 to 10.00
Axle turnings, heavy	10.50 to 11.00
Cast borings	8.00 to 8.50
Stove plates	11.50 to 12.00

BUFFALO.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, March 24.

Pig Iron.—The market continues dull, but sales agents who have been over this territory during the past week report that there are encouraging indications of a change for the better. The melters' stocks are said to be low. This condition is causing them to keep in close touch with the sources of supply in the matter of inquiries, though buying is slack. There is some variation in prices quoted. The Buffalo Union furnaces of M. A. Hanna & Co. have been closed down completely. We quote as follows, f. o. b. Buffalo:

No. 1X foundry	$17.80 to 18.30
No. 2X foundry	17.30 to 17.80
No. 2 plain	16.80 to 17.30
No. 3 foundry	16.30 to 16.80
Malleable Bessemer	17.50 to 18.00
Gray forge	15.50 to 16.00
Charcoal	22.50 to 23.50

Finished Materials.—The only item of interest in finished lines during the past week was the letting of a contract by the Erie City Iron Works, of Erie, Pa., for a new building 60 x 400 feet, in which about 240 tons of structural steel will be used. The Riter-Conley Mfg. Co., Pittsburg, was awarded the contract for the entire building.

ST. LOUIS.

Pig Iron Inquiries for Second Quarter Delivery.

March 23.

Pig Iron.—Orders for actual business were more numerous last week, and some inquiries were received for shipment over the second quarter of the year. Dealers in the St. Louis territory expressed the opinion that business was beginning to improve, and that the bottom in low prices has been reached. The 5,000-ton inquiry for basic iron, which has been out for about two weeks, has not been withdrawn.

Our quotations, f. o. b. Birmingham, to which $3.75 freight is to be added, follow:

No. 1 southern	$12.75 to 13.25
No. 2 southern	12.25 to 12.75
No. 3 southern	11.75 to 12.25
No. 4 southern	11.00

Coke.—But little interest was manifested in contracts for coke for shipment over the first half of the present year. Heavy shipments are being received in preparation for the strike which is expected to take place about April 1. Many foundrymen evince a desire to stock up. The best selected 72-hour Connellsville coke is quoted at $2.25 to $2.75 a ton, f. o. b., ovens, for immediate and future shipment. Furnace coke is offered at from $1.60 to $2. Virginia and West Virginia selected, 72-hour foundry coke is quoted at from $2.25 to $2.50 ovens for all deliveries. Furnace coke, 48-hours, is quoted at $1.75 to $2 and upward. The freight rate on coke from Connellsville and the Virginia and West Virginia fields is $2.80 and $2.90 to East St. Louis and St. Louis, respectively, and $2.40 from Virginia and West Virginia when destined beyond St. Louis.

Finished Material.—Architects are still firm in the opinion that quite a number of steel structures soon will be planned. However, none has materialized so far.

Old Material.—The market for old material continues dull, but dealers are hopeful and anticipate more active business in the near future. Our quotations follow:

Cast iron borings, free from foreign material, net ton	$ 5.00
Steel axle turnings, net ton	8.00
Steel railroad axles, net ton	14.00
Iron railroad axles, net ton	15.50
Miscellaneous steel scrap, gross ton	10.50
Cast iron borings (free) net ton	4.00
Old car wheels, gross ton	16.00
No. 1 railroad cast scrap, net ton	11.00
Heavy machinery cast, net ton	12.00
Stove plate and light cast, net ton	10.00
Sheet iron, net ton	4.00
No. 1 railroad wrought, net ton	12.00
Railroad malleable, net ton	11.50
Heavy melting steel, net ton	10.00

BIRMINGHAM.

Cast Iron Pipe Foundries Busy—Pig Iron Dull.

March 23.

The southern iron market shows very little change this week. The business being done by the Alabama producers would still indicate the hand to mouth policy on the part of consumers. There has been no improvement in the melt in the Birmingham district. The resumption of operations of the Central Pipe & Foundry Co. at Bessemer is looked for in the near future. The Sheffield Cast Iron Pipe & Foundry Co. recently secured a good order in Nashville and will move off some of its accumulated product. Considerable pipe is being shipped from the plants of the United States Cast Iron Pipe & Foundry Co. at Anniston and Bessemer, and there is a belief that it will not be long before both industries will be in full operation. Several rumors have prevailed recently that the big steel plant of the Tennessee Coal, Iron & Railroad Co., Ensley, will take a little breathing spell shortly. There is much activity in this part of the district and records are still being broken. There is but little accumulation of steel. The statement is made on good authority that some accumulation is desired. Foundations have been completed for heavy machinery to be installed in the rail mill, and in all probability this portion of the big industry will shut down to allow the placing of the machinery. The operatives, it is reported, will be employed at the Bessemer rolling mills, which are to be started up to use some of the steel that is to be accumulated. Officials here do not speak as if there is going to be a curtailment of production in the steel plants.

Reports from New York are to the effect that the reorganization committee of the Southern Steel Co. has prepared a statement that is receiving considerable attention by the stockholders. It is again reported that the plants of this company will resume operations May 1.

Pig iron quotations range from $12 to $13 for No. 2 foundry. The quotation given in several of the offices of the larger concerns is $13 per ton for No. 2. Outside reports place the minimum at $12.

Iron on the Genoa, Italy, order for 3,500 tons, is being shipped from the Bessemer furnaces. There is not much iron on the yards at Bessemer and the completion of the order will see the yards as bare as they have been in years.

No. 3 furnace of the Republic Iron & Steel Co., had to be blown out during the past week. No. 2 is to be blown in shortly, while No. 1 was blown in a few weeks ago.

A meeting of southern stove makers was held in Birmingham during the past week. As usual, there was no information given out as to the nature of the business transacted. Two stove foundries are now being erected in the Birmingham district and announcement is made that others are considering location here.

BRITISH IRON MARKET.

Demand for Foundry Iron Heavy and Well Maintained.

Office of THE IRON TRADE REVIEW, Princes Chambers, Corporation St, Birmingham, Eng., March 14.

The improvement in pig iron was very strongly felt in Birmingham on Thursday, when considerable buying occurred. Buyers are becoming afraid of a shortage, consequently there were some large orders on offer, but sellers in some cases were shy in taking on heavy contracts, and parcels were accordingly cut down to one-half. Some of the furnaces have now six to eight weeks orders on their books. The increased firmness is quite equal to an advance of 6d to 1s upon the figures a week ago. In the Midland district, there are no stocks, and the output is comparatively restricted, owing to several furnaces being off for relining and repairs. The same may be said of Cleveland, where a couple of furnaces have had to blow out. For some reason the Cleveland district is hardly so hopeful of the continuance of the improvement as it was some time ago, but during the past week prices for No. 3 have touched 51s 9d ($12.65), the best price for the past four months. In that district order books are well filled for the next six weeks, so that reductions are not likely. The present stock is 84,927 tons which represents a slow but decided fall, and appears to suggest that a very slight improvement will be necessary to clear out the lot. Forward prices are not quite so good as they were. The improvement in hematite is maintained, East Coast mixed numbers being now 59s ($14.44). The present stock is the smallest since the spring of 1904, and two years ago it was 750,095 tons. The demand for foundry iron continues excellent.

GERMAN IRON MARKET.

Buyers are Shy and Pessimism is Prevalent.

Dusseldorf, March 8. — Notwithstanding our bank rate has now been reduced to 5½ per cent, our iron market remains in its calm and reserved state. Buyers continue to be very shy and only buy from hand to mouth, and even the recent reductions in the prices for pig iron have not increased the orders for the pig iron syndicate. Whilst at the beginning of 1907 it had orders for about 950,000 tons in its books, the sum of orders early this year was only about 260,000 tons. At present, the daily quantity of orders coming into the pig iron syndicate is about 2,600 tons. On account of the decreased consumption of pig iron the coal syndicate has decreased the capacity of the coke makers by 20 per cent, whilst the coal production has been cut down by 10 per cent. Notwithstanding this decrease the stocks at the mines grow slowly.

The inland demand for all sorts of iron being too small to keep works going, the above two syndicates have again introduced the previous export

premium, which for a ton of finished iron amounts to 15 marks per ton, in order to get more orders from abroad. Nevertheless, the monthly reports of the "Stahlwerksverband," which comprises our whole production of half-finished material, show a constant decrease, except in railway material in which there are still sufficient orders on account of the big contracts made by the state railway. Especially in bar iron, iron sheets and plates, orders are very scarce and most of the manufacturers have only sufficient orders for a week or two, because the general building trade, especially ship building, is in a deplorable state. The recent efforts to form again syndicates for the sale of bar iron, iron sheets and plates and wire had to be dropped, some of the biggest manufacturers remaining obstinate.

Regarding the prospects, there are only a few optimists, who believe that the cheaper money will bring an improvement in spring, but generally pessimism is prevalent.

METAL MARKET

NEW YORK.

March 23.

Copper.—A stronger tone both in export and domestic business, with evidences of a disposition to place orders for deliveries somewhat further in the future, has had the effect of advancing prices about ¼c per pound over those of a week ago. Actual transactions, however, are still limited. We quote: Lake, 12¾c to 13¼c; electrolytic, 12⅝c to 13c; casting, 12¼c to 12½c. Base prices for sheets and wire are unchanged.

Pig Tin.—The advance continues, chiefly because of active business abroad, though there is an increased demand among consumers in this country. Current business is on the level of 30½c.

Pig Lead.—There has been a sharp advance on a limited volume of business, this being explained by the fact that smelters' stocks are diminishing through a curtailment in operations. The present level ranges from 3.85c to 4c, New York.

Spelter.—The market is practically stationary at 4.60c to 4.70c, New York, but the tone is firmer as production is being cut down to a considerable degree.

Antimony.—We quote: Cookson's, 8¾c to 9c; Hallett's, 8½c to 8¾c; ordinary brands, 7¾c to 8c.

CHICAGO.

March 24.

The tin market continues strong and prices are somewhat higher than a week ago. Other quotations are little more than nominal, as trading is very quiet and sales few.

Lake copper, 14c to 14¼c; casting, 13½c to 13¾c; pig tin, 33c to 33½c; spelter, 5c to 5.10c; pig lead, desilverized, 4c to 4.10c in 50-ton lots; corroding, 4.60c to 4.75c in 50-ton lots; car lots, 2½c per 100 pounds higher; sheet zinc, 7c list, f. o. b. LaSalle, in car lots of 600-pound casks; Cookson's antimony, 12½c to 13c; other grades, 12c to 12½c.

The slight improvement noted in the market for old metals is not sufficient to bring about increased prices, and we quote, to dealers, as a week ago:

Copper wire, 11c; heavy copper, 11c; light copper, 10¼c; heavy red brass, 10c; heavy yellow brass, 8c; light brass, 6c; No. 1 red brass borings, 8¼c; No. 1 yellow brass borings, 7c; brass clippings, 8c; tea lead, 2⅞c; lead scrap, 3⅛c; zinc, 3¼c; tin pipe, 25c; tin foil, 21c; pewter, 16c; electrotype plates, free from wood, 3¾c; electrotype dross, 2½c; stereotype plates, 4¼c; stereotype dross, 2⅞c; prime slab zinc dross, $62 per ton.

ST. LOUIS.

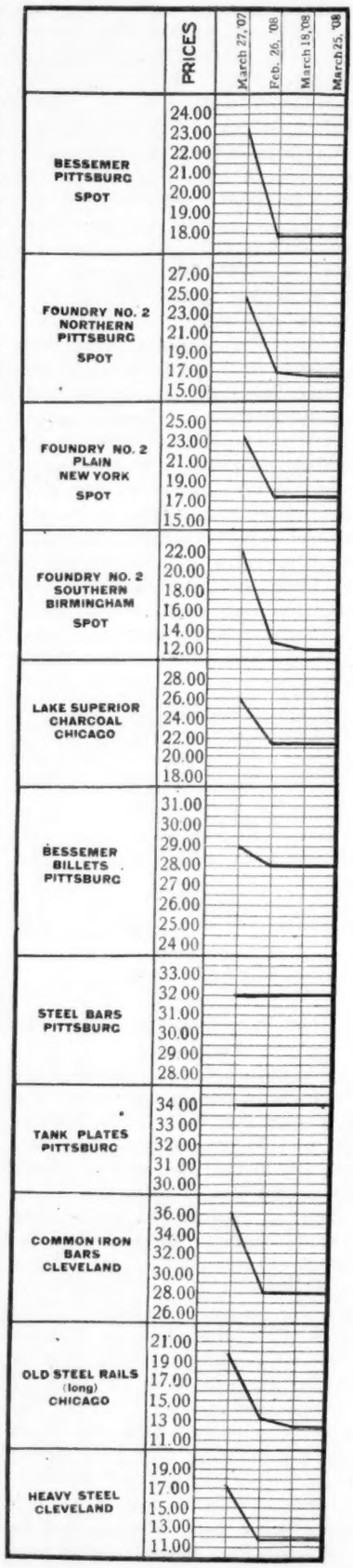
March 23.

Lead and Zinc.—The action of the Lanyon Zinc Co., St. Louis, taking all ore for sale in the Joplin district on a base price of $35 to $35.50 per ton of 60 per cent zinc, gave evidence of the strong demand for medium grade zinc ores during the last two weeks.

The high point last week was $40 per ton on an assay base price of $36 per ton of 60 per cent zinc. The best grades of ore were freely purchased on this basis. The announcement by the American Smelting & Refining Co. of a fixed schedule of prices at 4 cents a pound has resulted in an advance of $4 a ton in lead prices during the week. Shipments of both ores were good, and a large proportion of the reserve stocks were swept away.

Ballou's White Sand Co., Millington, Ill., miner and shipper of high grade white silica sand and magnesia core sand, is erecting a modern washing and screening plant, and expects to be ready to ship washed silica sand about May 1. The plant equipment will consist of high pressure marine boilers, vacuum pumps, steam pumps, washers, screens and drain bins, and will have a capacity of about 30 tons per hour.

PRICE CHART.



COKE PRODUCERS

Explain Mining Conditions to Pennsylvania Legislators.

Pennsylvania coke producers are devoting much attention at the present time to a movement toward some revision of the mining laws of the state. A committee representing the Independent Coke Producers' Association recently conferred with state officials to explain the conditions prevailing in the coke producing territory of Fayette and Westmoreland counties, where the coal is mined exclusively for coking purposes.

In the greater portion of this territory, blasting is not practiced, nor is it necessary for the reason that the coal is softer and is easily mined by hand, but in some sections, particularly in the southern end of Fayette county, the coal is much harder, consequently more difficult and expensive to mine. In the case of some operations in this latter territory, it is impracticable to mine the coal without blasting.

Undercutting is not practiced for the reason that coarse coal is not required as in the coal producing districts. On the contrary, the smaller the coal for coking purposes, the better. In other districts where coal is produced for market, undercutting is a necessity. The operator must do so in order to produce largest percentage of lump or coarse coal, but in this operation an element of danger is added in the form of coal dust. The Coke Producers' Association asks for a law flexible enough to cover these different conditions. It maintains that blasting coal from the solid is perfectly safe under proper regulations, such as the employment of shot-firers and the use of safety explosives. Where coal is mined by hand, as in the Connellsville district, the quantity of dust is inconsiderable. In other words, it is not to be found in dangerous quantities. Recent experiments have shown that undercutting by hand produces about the same quantity of dust as in machine mining; therefore it is claimed that undercutting in the case of the coke producers would add a very serious element of danger.

It is declared that in the mines where disastrous explosions have occurred in the past year, undercutting was practiced, so that in no instance could any of these be charged to blasting from the solid. In one large operation in Fayette county, where shooting out of the solid has been practiced for the last four years, 250,000 pounds of safety explosives were used in that time without a single accident of any kind to either miners or shot-firers. The shooting was all done by men especially employed and skilled in the work. The miners simply drilled the hole and prepared the tamping. If the hole was not properly drilled, the shot-firer required him to re-drill it.

Blown-out shots, the coke association claims, occur regardless of whether the face is undercut or not, and are due to improper drilling and improper tamping of the hole, or both. Where flaming explosives, such as black powder and dynamite, are used a blown-out shot is a serious matter, particularly where gas or dust is present. With a safety explosive it is different, as there is not sufficient flame to affect either.

In the district where the plants of the members of the association are located, safety lamps are in use, and other strict regulations are enforced for the protection of life and property. The district produces a very large tonnage, and the coke operators feel that their interests and conditions should be considered in the framing of any new legislation for the bituminous district.

BIG INCREASE.

(Continued from page 561.)

open-hearth steel made by the basic process and 1,269,772 tons by the acid process, while in 1906 the production by the basic process amounted to 9,658,760 tons and by the acid process to 1,321,653 tons. This is a gain in production in 1907 over 1906 by the basic process of 620,555 tons but a loss by the acid process of 51,880. In 1905 there were made 7,815,728 tons of open-hearth steel by the basic and 1,155,648 tons by the acid process.

The following table gives the production by states of both basic and open-hearth steel ingots and castings in 1907. Pennsylvania made over 66.4 per cent of the total production of basic steel ingots and castings in 1907 and over 82 per cent of the total production of acid steel ingots and castings, against 68.4 per cent of basic and over 83.3 per cent of acid ingots and castings in 1906. Illinois, Ohio, and New York were the next largest producers of open-hearth steel in each of these two years.

States. Gross tons.	Basic open-hearth steel.	Acid open-hearth steel.	Total. Gross tons.
New England..	172,960	66,837	239,797
N. Y. and N. J.	665,474	40,545	706,019
Pennsylvania ...	6,826,479	1,041,226	7,867,705
Illinois	1,006,589	6,662	1,013,251
Ohio	758,401	61,241	819,642
Other states....	849,412	53,262	902,674
Total 10,279,315		1,269,773	11,549,088

Ingots and Castings.

The production of open-hearth steel ingots in 1907, excluding castings, amounted to 10,803,211 tons, against 10,260,522 tons in 1906, an increase of 542,689 tons, or over 5.2 per cent. The production of castings alone in 1907 amounted to 745,877 tons, against 719,891 tons in 1906, an increase of 25,986 tons, or over 3.6 per cent.

Basic and Acid Ingots.

The following table gives in gross tons the production of basic and acid open-hearth steel ingots in 1907 by states.

States. Gross tons.	Basic ingots.	Acid ingots.	Total. Gross tons.
New Eng., N. Y., and N. J.....	782,325	63,282	845,607
Pennsylvania 6,766,950		792,471	7,559,421
Ill., Ohio, and other states 2,363,564		34,619	2,398,183
Total 9,912,839		890,372	10,803,211

Basic and Acid Castings.

As already stated, the total production of open-hearth steel castings in 1907 amounted to 745,877 tons, as compared with 719,891 tons in 1906. The production in 1907 was the largest in our history. The year of next largest production was in 1906. Of the total production in 1907 379,401 tons or almost 51 per cent, were made by the acid process and 366,476 tons, or over 49 per cent, was made by the basic process. As compared with 1906, when 406,343 tons of castings were made by the acid process, the decrease in 1907 by this process was 26,942 tons. By the basic process the increase was 52,928 tons, the production by this process in 1906 having amounted to 313,548 tons.

The following table gives the production of open-hearth steel castings by both the basic and acid processes in 1907 by states:

States. Gross tons.	Basic castings.	Acid castings.	Total. Gross tons.
New Eng., N. Y., and N. J.....	56,109	44,100	100,209
Pennsylvania	59,529	248,755	308,284
Ill., Ohio, and other states 250,838		86,546	337,384
Total 366,476		379,401	745,877

GOMPERS' INJUNCTION IS MADE PERMANENT.

The American Federation of Labor, President Gompers and others of that organization, were permanently enjoined, March 23, from "conspiring, agreeing or combining to restrain, obstruct or destroy" the business of the Buck's Stove & Range Co. in a decision of the supreme court of the District of Columbia. This makes permanent the temporary injunction of Justice Gould against the Federation in that case. An appeal was immediately noted. This decision bars the Federation from in any manner calling the attention of the public to the Buck's company or its business, and also bars the Federation from placing the company on the "we don't patronize" list, in Missouri or elsewhere.

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March 26, 1908

THE SOUND SHOWING OF THE STEEL CORPORATION.

Viewed from any standpoint, the showing made by the United States Steel Corporation is a very sound one. The annual report has just been issued and is reprinted quite fully elsewhere in this issue.

As a statement of the earnings and deductions for depreciation, interest, dividends and special construction for the calendar year was printed in THE IRON TRADE REVIEW of Feb. 6, with full comments, no special reference to the earnings need be made at this time. The statement then given was compiled by us from the four quarterly reports, and agrees substantially with the report now presented by the Steel Corporation. The net earnings were $161,000,000 in 1907, against $157,000,000 in 1906, showing a substantial gain, although the two closing months of the year had developed a serious decline, so that the rate of earnings during the first 10 months of 1907 had scored a very important advance over the corresponding earnings in the previous year.

The position of trade at present adduces remarkable testimony to the wisdom of the change in accounting methods made Jan. 1, 1904. As of that date the Steel Corporation management decided not to bring into the general profit account profits, made by subsidiary companies upon materials shipped to other companies, but not yet worked up by these others and shipped to outsiders. Such profits are carried in a separate account, and not brought into the general account until the material has actually passed beyond control of any subsidiary. Commenting upon this change, the report for 1903 said:

"This plan has been adopted as conservative and safe. Although it may seem to be a radical departure in methods of accounting from those heretofore followed by this Corporation and from those in very general use by organizations having several subsidiary branches, such as large mercantile concerns with manufacturing, jobbing and retail departments, it is believed it will prove to be most satisfactory to the stockholders of the Corporation."

This prediction has now been fully justified. The change of Jan. 1, 1904, did not involve any reduction in inventory valuations at the time. The present inventories include these intercompany profits, but in the balance sheet the expected profits accruing are carried in a special surplus account, not having been passed to general earnings. Such profits amount to $27,908,753, an increase of $9,744,693 over the previous year. Probably they will be carried into general earnings in due course, but if otherwise the book showing will not be adversely affected.

The inventories total $136,188,874, an increase of $16,291,407. The increase in ores alone would account for this increase, while there was an increase of $2,507,804, due to the inclusion, for the first time, of the Tennessee company's materials. In other items there was a net decrease, and since the ore is a perfectly safe item and the Tennessee inventory purely an incident, the inventory statement makes a very good showing.

The Tennessee company acquisition is described in detail. In substance it was that the $30,000,000 of 10-60 second mortgage bonds, which has been executed and certified in 1903, but had not borne interest and had not been carried as an asset, were turned over, together with bonds purchased in the open market, using some $4,500,000 cash, in exchange for some $30,000,000 of Tennessee company stock, the basis being the assumption that the stock was worth 100 and the bonds 84. There are some $15,000,000 of Tennessee company obligations, including bonds, preferred stock, etc., which become a charge upon the Steel Corporation, although not specifically guaranteed by it. The Tennessee company properties come into the property account in the balance sheet at about $50,000,000, exactly their cost value based upon the $30,000,000 of treasury bonds and the bonds bought for cash given in exchange, plus the $15,000,000 Tennessee company obligations. The Tennessee company's net profits in 1907 were $1,426,685, after providing the charges on the $15,000,000 or so bonds, etc., and against such earnings the Corporation increases its issue of 5 per cent bonds $30,000,000 and uses some $4,500,000 cash, involving an interest charge of about $1,750,000 annually. This, it will be observed, slightly exceeds the earnings in 1907, but of course had the earnings been very large the property could not have been bought, and with the extensive improvements recently made the earning power of the property is greatly increased. More than $6,500,000 was expended on improvements in 1907.

The statistics of production by the Steel Corporation reflect the prompt measures taken to prevent the accumulation of material when demand fell off. The production of pig iron, of steel ingots, and of finished material for sale, all show a slight decline from 1906, while statistics thus far available show that the industry as a whole made a measurable increase in pig iron production, and but a negligible decrease in steel ingot production. Thus the Steel Corporation's proportionate output decreased. The following table shows the percentage which the Steel Corporation's output has constituted

of the country's total output, in pig iron, in Bessemer and open-hearth steel ingots and castings, and in Bessemer steel rails:

	Pig Iron.	Steel.	Bessemer Rails.
1902	44.7	65.7	65.4
1903	40.4	63.5	65.6
1904	44.6	61.0	57.2
1905	44.2	60.2	53.6
1906	44.5	58.1	52.6
1907	42.0	56.4	51.2

It will be observed that in 1903, when a depression started late in the year, the Corporation promptly curtailed production, and showed a decreased percentage in pig iron from 1902 to 1903, but in 1904 on getting its second wind regained the lost ground. From 1906 to 1907 its pig iron percentage again dropped, from 44.5 to 42.0 per cent. The fact that the Corporation's pig iron percentage in 1906 was substantially the same as in 1902, while its steel ingot percentage dropped from 65.7 to 58.1 per cent, is interesting. One reason for the change is that in 1902 the Steel Corporation used more purchased pig iron than in 1906, but that does not explain the principal part of the change, which is due mainly to the swing from Bessemer to open-hearth steel. The production of Bessemer steel ingots is always somewhat less than the production of Bessemer pig iron, while the production of open-hearth ingots is, roughly, about double the amount of the pig iron used. Accordingly as the proportion of open-hearth steel production increases, the proportion of steel produced to pig iron produced also increases. The Corporation made 41.3 per cent more pig iron in 1906 than in 1902, and 38.7 per cent more steel. In 1902 the country at large made 83.2 per cent as large a tonnage of steel as it did of pig iron, but in 1906 91.9 per cent, and the Corporation failing to show a similar increase fell behind in steel production while it did not in pig iron. A subsidiary influence has been that the Corporation uses direct metal more largely than outsiders, thus using more pig iron and less scrap than do outsiders.

Notice of a wage reduction of 10 per cent, affecting 39,500 employes of the New England cotton mills has been posted. The reduction is to go into effect March 30.

THE MARCH OF OPEN-HEARTH STEEL.

As was to have been expected, production of open-hearth steel in the United States established a new high record in 1907, the output being 11,549,088 gross tons of ingots and castings, an increase of 568,675 tons, or 5.1 per cent, over 1906, which had held the record.

This increase, coupled with the slight decrease in Bessemer steel production, has made it that open-hearth steel production has practically overtaken Bessemer steel production. It fell short in 1907 by only 118,461 tons, while in 1905 it had fallen short by 1,295,417 tons.

In discussing the pig iron statistics on Feb. 13 we predicted that Bessemer steel production would prove to be about 11,650,000 tons in 1907. The statistics which came out later showed the production to have been only 17,549 tons greater than our estimate. The open-hearth statistics have come out about 100,000 tons short of our prediction for open-hearth steel, which was 11,670,000 gross tons.

Our total steel output, ingots and castings, was as follows in 1907, assuming that the output of crucible and other special steels was unchanged.

	1906.	1907.
Bessemer	12,275,830	11,667,549
Open-hearth	10,980,413	11,549,088
*Miscellaneous	141,893	141,893
Total	$23,398,136	$23,358,530

*Estimated.

It must be remembered that these are not the statistics of the production of merchantable steel, but of the production of ingots and castings. In other words, they are the record of the ingot scales. One method of manufacturing open-hearth steel is to leave a portion of the refined bath in the furnace, and allow it to dilute the fresh pig iron added; another is to charge scrap with which to dilute the pig iron. A large part of the scrap, in this latter case, is material which has already passed over the ingot scale and gotten into the statistics, but has never been merchantable steel. Thus the production of ingots is very much larger than the production of finished steel for the market. In 1906 the total of all rolled steel was 17,401,911 tons, this including rolled forging blooms and rolled forging billets, but excluding the minor items of forged armor plate, hammered axles, etc., whereas the steel ingot statistics in that year (excluding castings) were 22,624,431 tons, the difference being 5,222,520 tons. This was not material lost in process of manufacture. Had it been an actual loss the tonnage would not have been allowed to slip away. It was largely scrap, weighed on the ingot scales, and then used again in a profitable way, with no loss outside the cost of shearing and remelting.

Thus it is that we can make 25,307,191 gross tons of pig iron as we did in 1906, and make 23,398,136 tons of steel ingots and castings, only 1,909,055 tons less, and still have pig iron for the puddling furnaces and for 6,000,000 or 7,000,000 tons of gray iron castings. The proportion of actual old material going through the open-hearth furnaces is relatively small.

The total production of open-hearth steel castings in 1907 showed an increase, acid open-hearth steel castings showing a slight increase and basic castings a material increase. A brief comparison showing the growth of the open-hearth steel casting industry is given below:

OPEN-HEARTH STEEL CASTINGS.

	Basic.	Acid.	Total.
1898	28,460	92,127	120,587
1899	39,689	130,040	169,729
1900	42,644	134,847	177,491
1901	94,941	206,681	301,622
1902	112,404	255,475	367,879
1903	134,879	265,469	400,348
1904	98,919	203,915	302,834
1905	206,159	320,381	526,540
1906	313,548	406,343	719,891
1907	366,476	379,401	745,877

It will be observed that the basic process is steadily gaining on the acid, and should overtake it in a year or two.

Steel Foundries Report.—The American Steel Foundries has issued a statement of earnings, including income from subsidiary companies, for the half year ending Jan. 31, 1908, as follows:

Net earn. from oper. after deduct. mfg. selling exp. etc.		$824,124
Other income — interest, etc.	$ 20,017	
Miscellaneous	1,917	
		$ 21,934
		$846,058
Deduct int. on bonds	$116,150	
Sinking fund	52,500	
Depreciation	111,500	
		$280,150
		$565,908

MUCH IMPROVEMENT

REPORTED BY MILWAUKEE BUSINESS MEN.

Larger Forces in Many Plants.—Lower Prices on Fabricating Structural Steel and on Cast Iron Pipe.

Milwaukee, Wis., March 23.—There is steady improvement in the iron and steel business in Milwaukee and although the change is taking place slowly, the improvement bids fair to be substantial and to continue. Nearly all of the Milwaukee foundries have felt the effect of the improved conditions and where orders have not increased there have been many inquiries. The structural iron and steel companies and the blast furnaces have experienced the least improvement. The Northwestern furnaces at Mayville, Wis., controlled by Pickands, Brown & Co., Milwaukee, are in full operation and have been running full except for a few weeks when one of the stacks was off. The Thomas furnaces in the city have not as yet resumed operations but it is reported that the company is in receipt of numerous orders of late that may warrant a resumption in the near future.

A number of men have been put to work in the foundry and molding rooms of the George A. Smith Steel Co. during the past week and the firm reports a favorable increase in the business. The company suffered from a molders' strike earlier in the year and while this has not been officially called off it is stated that a number of union men have applied for reinstatement at the plant.

The new foundry building of the National Brake & Electric Co. is rapidly being completed. The company reports an increase in orders and inquiries of late.

Orders have been increasing at the Filer & Stowell Co., in Milwaukee. Four Corliss engines have been ordered from the company by the Jucaro & Moran Sugar & Land Co., of Cuba, for sugar mill work. Two of the engines are 600-horsepower each and the other two are each of 300-horsepower. The company is also building a circular saw mill of the double variety for the Hawaiian Mahogany Lumber Co., of Hilo, Hawaii, which is to be used in cutting ties for the Atchison, Topeka & Santa Fe railroad.

Inquiries are continuing to come in at the plant of the Vilter Co. in Milwaukee and more men are gradually being added to the pay roll each week. One 50-horsepower Corliss engine was sold to a Nebraska firm the past week and many orders for ammonia piping and fittings have been received from various points in Wisconsin.

One of the big 150-ton carrying cranes of the Milwaukee-Western Fuel Co. was recently blown down in the south yards of the company and is now a wreck for the time being, entailing a loss of $20,000. The crane was one of the largest in the city and represented when new an investment of $40 000. It will be rebuilt.

Robert W. Hunt & Co., of New York and Chicago, have submitted to the Milwaukee board of public works plans and estimates for installing a municipal electric lighting plant in case the proposition to allow the city to enter such an undertaking passes the common council in the city. A plant of 2,000 arc lamp power would cost the city of Milwaukee $920,867 according to the estimates furnished by the Hunt Co. It has also estimated that a gas plant to generate power for 3,000 lights would cost $1,245,449.60. The city engineer and the members of the board of public works favor the gas power producing plant. Ground for a municipal lighting plant has already been purchased by the city and it is the desire of the board of public works commissioners to start the plant as soon as possible.

Arthur Vogel has been awarded the contract for the construction of the Kinnickinnic avenue bridge at the bid of $119,842, which was $108 lower than that made by the Milwaukee Bridge Co. The highest bid made was that of the Strobel Steel Construction Co., whose bid was $134,000. The bridge is to be of the bascule type and will be 40 feet wide and must be finished by November 1. The present bridge spanning the Kinnickinnic becomes the property of the contractor.

Hackendahl & Schmidt, 1513 St. Paul avenue, Milwaukee, have been awarded the contract for furnishing the structural iron for the $75,000 flat building that is to be erected at Farwell avenue and Keene street, in Milwaukee. Joseph Romberger, 2121 Cherry street, received the contract for the galvanized iron work.

The contract for the steel reinforcement of the $450,000 auditorium in Milwaukee has been awarded to the Inter-State Iron & Steel Co., Chicago. Over 300 tons of the steel are to be required in the big structure upon which work will soon be started.

The Wisconsin Engineering & Surveying Society is the name of an organization that has recently been formed at Oshkosh, Wis. Similar organizations exist in Illinois and Michigan and for some time there has been a desire for such a body in Wisconsin. G. H. Randall, city engineer of Oshkosh, has been elected president and the first annual meeting of the society will be held at Madison.

The Valley Iron Works at Appleton, Wis., is constructing the beaters and the Appleton Machine Co. the Jorden engines for the paper mill that is being erected near Portland, Ore., by W. P. Hawley.

The Marinette Iron Mfg. Co., Marinette, Wis, is finding that business is rapidly increasing. Four machinists have been added to the force the past week and the company is now employing a force of 30 men. The plant is turning out pumps and gas engines at present.

Basing their statements on the sale of coke, the Milwaukee Coke & Gas Co. reports that the month of February was fully 50 per cent better than the month of January and the business outlook for the present month is much better.

The leading coal companies in the country are making many purchases of electrical generators, motors and transformers. The Allis-Chalmers Co., in Milwaukee, has been active in supplying this class of trade and reports the sale of apparatus to more than 25 of the largest coal and mining companies in Pennsylvania and West Virginia besides sales to many iron and steel plants of the country.

The F. M. Prescott Steam Pump Co., in Milwaukee, says that so far the present month has brought it a decided increase of business and that prospects are much brighter than last month. Many new orders are being received. The Smith & Post Co., manufacturer of the metal sawing machines, is well pleased with the opening of the month and believes that there is a prospect of a steady business increase.

C. M. Conklin, of Eaton Rapids, Mich., has sold his interest in the Eaton Rapids foundry to Bert Littell, who, with L. F. Hosler and others, has organized a new company with $10,000 paid up capital. Besides the usual foundry work, furnaces will be manufactured at the plant.

PASSED THE SENATE.

Ocean Mail Subvention Bill Is Put Up to Representatives.

The ocean mail subvention bill passed the United States senate March 20 by an aye-and-no vote after an interesting debate. An amendment was offered by Senator Bacon, of Georgia, providing that at least one line of ships getting the benefit of the mail carrying contracts should be required to make at least two stops south of Cape Charles on the way to South American ports. Senator Newlands, of Nevada, offered an amendment providing for a foreign commerce commission, consisting of the secretary of the navy, the postmaster general and the secretary of commerce and labor, with instructions to report to congress. The amendment further provided that the government should build the ships that were to carry these ocean mails and have them of such a character that they could be utilized as auxiliary ships in war. Senator Hale, of Maine, upheld the suggestion of the Nevada senator, pointing out that out of the colliers which are attending Admiral Evans' fleet on its long voyage, nine only are American, and the others, 28 in number, are chartered from foreign owners. Senator Gallinger offered a substitute for Mr. Bacon's amendment and Mr. Bacon's amendment was withdrawn. The Gallinger amendment provides that if the two lines are to be established, the contracts of the government shall provide that one of the lines shall call at two ports south of Cape Charles. The bill then was passed.

Notes Cheapest Purchase. — In awarding the contract for 400 tons of water pipe to the Massillon Iron & Steel Co. at $22.60 a ton, the Ft. Wayne, Ind., water works board said it was the cheapest price ever paid for like pipe by the department. Six other firms bid on the contract, the prices being $23.30, $23.60, $23.90, and $25. The Massillon company also was given the contract for special fittings at 2½ cents a pound.

Dismantled Plants Sold.—President J. W. Duntley, of the Chicago Pneumatic Tool Co., has just issued his annual report, having returned from Europe. His report contains the figures for 1907 published at the time of the annual meeting in January. After calling attention to the successful operations of subsidiary plants in the Canadian and European fields, President Duntley said:

"An additional plant was purchased during the year, located at Franklin, Pa., in order to increase facilities for the manufacture of rock drills. This plant being located adjacent to one already owned by the company, the two are operated practically as one unit, thereby insuring greatest economy in operations. A mortgage of $75,000, mentioned under liabilities, was assumed at the time this plant was purchased.

"The plants which were dismantled some years ago, in order to consolidate manufacturing operations, located at Aurora, Ill., and Olney, Pa., were sold during the year, thereby eliminating the expense of maintaining them."

PROGRESS MADE

At Meeting of Pig Iron, Foundry and Transportation Interests.

The committee of 22, recently appointed at a joint meeting of pig iron, foundry and transportation interests to work out a solution of the short weight problem, and the fixing of responsibility therefor, held an all-day meeting at the Bellevue-Stratford Hotel March 18. There were 21 in attendance, G. R. Browder of the Southern Railway Co. being the only absentee, though several other members were represented by substitutes. B. M. Shaw, one of the New England Foundrymen's Association representatives, was made chairman of the committee, and A. A. Miller of the Philadelphia Association served as secretary.

The morning discussion was given over entirely to shortages arising in the transportation of coke, and the afternoon to pig iron. The meeting partook somewhat of the nature of an experience meeting, the discussion being entirely informal, as it was believed this method would develop a mass of valuable information and suggestions on the questions involved. A large amount of data gathered by the New England Association and others was presented to the gathering as a preliminary on which to work. No definite action was taken; in fact, but one minor motion was made during the day, but at the conclusion of the meeting it was felt that much had been accomplished through the interchange of ideas, and that the questions under discussion are now much nearer solution than before. The meeting was executive, but a stenographic record was kept of the entire discussion and this will be presented in printed form to Henry A. Carpenter, the chairman of the gathering at which the committee was appointed. Those at the meeting were:

J. L. Anthony, New England Foundrymen's Association.
B. M. Shaw, New England Foundrymen's Association.
W. S. Hallowell, Philadelphia Foundrymen's Association.
A. A. Miller, Philadelphia Foundrymen's Association.
H. E. Field, Pittsburg Foundrymen's Association.
S. D. Sleeth, Pittsburg Foundrymen's Association.
B. F. Fackenthal, Thomas Iron Co.
J. O. Henshaw, Woodward Iron Co., and Virginia Iron, Coal & Coke Co.
Leonard Peckitt, Empire Steel & Iron Co.
W. H. Stanford, Tennessee Coal, Iron & Railway Co.
Abel Mishler, Davis Coal & Coke Co.
W. A. Smith, Jamison Coal & Coke Co.
C. S. Hoskins, freight traffic manager, Merchants' & Miners' Transportation Co.
T. W. Gallagher, general freight agent, Baltimore & Ohio Railroad Co.
H. M. Matthews, general coal and coke agent, Baltimore & Ohio Railroad Co.
F. E. Herriman, coal traffic manager, New York Central & Hudson River Railroad Co.
E. H. Bell, New York Central & Hudson River Railroad Co.
R. C. Wright, general freight agent, Pennsylvania Railway Co.
R. H. Large, coal freight agent, Pennsylvania Railway Co.
W. T. Lamour, Boston & Maine Railroad Co.
F. S. Holbrook, general freight agent, New York, New Haven & Hartford Railroad Co.

LOSSES REACH MILLIONS.

Summary of 114 Molders' Strikes Shows Futility of Closed Shop Struggle.

A summary of 114 strikes in 99 cities from 1904 to and including 1907 compiled by *The Review* of the National Founders' Association shows that the seven years' effort along the line of conciliation as a policy had been a failure. During these seven years there were held approximately 2,500 conferences, in which officers of the molders' union participated and were afforded a liberal hearing. In 1905 the founders declared it impossible to tolerate conditions longer. Efforts of the union culminated in 1906 in the molders' organization inaugurating the largest strike ever known in the foundry business.

At the time this strike was declared, proprietors were short 30 per cent of the requisite number of journeymen to man their plants, while the castings market was more active than it ever had been. Notwithstanding this drawback, the proprietors entered the contest to defend themselves, and won. In this time, the molders' union expended in strike benefits approximately $1,382,965.85, and in the same length of time lost in wages approximately $3,803,935, so that in three and one-half years of futile attempt to enforce the strictly closed shop policy the union molders' actual money loss was five and a quarter million. While these strikes were lost fully a year ago, yet it was not until within a few months that the molders saw fit to call them off and suspend further payment of strike benefits.

PERSONALS.

George E. Woodworth, auditor of the Standard Car Wheel Co., Cleveland, who was recently operated upon for appendicitis, has recovered and resumed his duties.

L. C. Hanna, of Cleveland, C. B. Morris and E. T. Stotesbury, of Philadelphia, were re-elected directors of the Cambria Steel Co. at the recent annual meeting.

D. Ralph Day, secretary of the Northwestern Malleable Iron Co., Milwaukee, Wis., for the past eight years, has resigned to accept the position of manager of the Moline, Ill., plant of the Union Iron Co.

George D. Evans, assistant manager of sales of the Cleveland office of the Republic Iron & Steel Co., who has been confined to his home for ten weeks with a fractured knee, is expected to resume his duties next week.

John M. Jamison, president of the Jamison Coal & Coke Co., has announced himself as candidate for the Republican nomination of state senator from Westmoreland county, Pa. Mr. Jamison has no opposition in his own party.

Thomas McDonald, district superintendent of the Carnegie Steel Co. mills in Youngstown, O., and Greenville, Pa., is returning from a tour of the West Indies and Cuba and will arrive home Friday. Mr. McDonald is accompanied by his wife.

J. M. Thomas, president of the Thomas Furnace Co., Milwaukee, and one of the directors under the re-organization of the Jenifer Furnace Co., has leased "The Pines" at Anniston, Ala, and will spend some time in the southern district.

Wade H. Echard, president of the Northern Connellsville Coke Co., Connellsville, Pa, has resigned, and has been succeeded by Daniel Hunt, of Uniontown, Pa., who has been vice president. James H. Doyle has been made vice president. Mr. Echard also retired as a director.

Buckner A. Wallingford, junior partner in the firm of Walter-Wallingford & Co. of Cincinnati, will on April 1 move to Pittsburg to take charge of the company's office in that city. Mr. Walter will be in charge of the Cincinnati office as resident partner and Mr. Wallingford will be the resident partner in Pittsburg.

Wm. Wieman has been appointed exclusive sales agent in northern Ohio for the Sloss-Sheffield Steel & Iron Co., in addition to representing that company in Western New York, and western Pennsylvania. Mr. Wieman is associated with G. P. Bassett Jr., in the general pig iron and coke business, with offices in the Commonwealth building, Pittsburg.

Dr. Allerton Seward Cushman, of the public roads bureau of the department of agriculture at Washington, has been awarded the Edward Longstreth medal of merit by the Franklin institute, for researches on the corrosion of iron. Dr. Cushman studied at Worcester Polytechnic Institute, at Freiberg, and at Heidelberg; was made master of arts by Harvard in 1896 and doctor of philosophy in 1897. He was assistant professor of chemistry in Bryn Mawr college in 1900 and 1901.

OBITUARY.

Peter J. Donohue, founder of the Brooklyn manufacturing concern of P. J. Donohue & Sons, died March 22 at the age of 80. He was at one time a United States boiler inspector.

John T. Madden, prominent manufacturer and head of the Madden Boiler Works, Hollidaysburg, Pa., expired suddenly at his home in Hollidaysburg March 23, aged 50 years.

OPPOSED TO BOYCOTTING.

Editor IRON TRADE REVIEW:—In your issue of Feb. 27, there appeared an article under special correspondence and entitled "Employers Ask Boycott, San Francisco Manufacturers Seek to Promote Strike of Structural Unionists." There has been a mistaken impression gained by your San Francisco correspondent of the meaning of the conference recently held between one division branch of this association and representatives of the housesmiths' and architectural iron workers' unions, judging from the article above referred to.

Seeking to encourage home industry and provide work for the unemployed in this city, a committee from this association did confer with the unions, but no boycott was urged to be placed upon the structural and ornamental iron material of eastern competitors. The executive committee of this association strongly condemns the boycott in any form. In this regard the employers of San Francisco differ from none of their eastern brethren, holding it to be nothing else than a "relic of barbarism" and an illegal combination or conspiracy.

H. F. DAVIS, Secretary.

California Metal Trades Association.
San Francisco, March 7, 1908.

SPLENDID SHOWING

In Reports Made to New York Convention of National Metal Trades.

(Special Telegram.)

New York, March 25.—Judging from the number of early arrivals, the attendance at the convention of the National Metal Trades Association will be unusually large. At the alumni dinner Tuesday night there was a record attendance, 28 being present. A pleasant feature of the evening was the presentation to President Barker, of a very handsome hall clock by members of the administrative council as a recognition of the valuable services which he has rendered during the year of his incumbency. Mr. Barker has been an ideal president, having devoted a large part of his time to the affairs of the association and having guided it with the sound judgment for which he is noted.

When the convention was called to order Wednesday morning, reports of an eventful year were submitted. Secretary Wuest stated that 126 strike cases had received attention, of which 109 were fought to successful conclusions, while 13 cases were settled without strikes being actually declared and only four strikes resulted unsatisfactorily for the association. The large number of strikes resisted, cost only $2,000 more than the fighting of 59 strikes cost in the preceding year. The report concerning membership was more encouraging, showing a net loss based on number of operatives of only 4 per cent, compared with last year. In view of the prevailing depression this is considered a remarkable showing.

The most important subject to be considered by the convention will be the proposed amendments to the constitution to be discussed Thursday morning. Final action will be taken by ballot of all members after the convention expresses its sentiments concerning the amendments and adjourns.

Bond Plan Abandoned.—Owing to the objection of minority stockholders of the Alabama Consolidated Coal & Iron Co. to the plan to exchange preferred stock for a new issue of third mortgage bonds, the management has decided to abandon the plan. Objection was based on the results of a recent examination by expert accountants showing that the earning power of the property made it undesirable to exchange 7 per cent cumulative preferred stock for 5 per cent third mortgage bonds in the opinion of stockholders.

ANNUAL REPORT OF THE STEEL CORPORATION

BIG EXPENDITURES FOR NEW CONSTRUCTION LAST YEAR

Purchase of the Properties of the Tennessee Coal, Iron & Railroad Co.—Progress in the Construction of the New Plant at Gary — Export Trade Heavy

The sixth annual report of the United States Steel Corporation for the fiscal year ended Dec. 31, 1907, shows that the volume of business done by all the companies during the year, as represented by their combined gross sales and earnings, equaled the sum of $757,014,767.68. This amount represents the aggregate gross value of the commercial transactions conducted by the respective companies, and includes sales made between the subsidiary companies, and the gross receipts of the transportation companies for services rendered both to subsidiary companies and to the public. The earnings for the year resulting from the above gross business represent the combined profits accruing to the several corporate interests on the respective sales and services rendered, each of which is in itself a complete commercial transaction.

The increase in the aggregate amount of business done by all companies in 1907 on the foregoing basis, as compared with the preceding year, was $60,257,876.67, divided as follows: Increase in sales value of products shipped to the public, $18,553,909.92; in sales value of products sold between subsidiary companies (including ore, coal and coke), $37,372,606.09; and in the gross earnings of the transportation and miscellaneous companies, $4,331,360.66.

The report is signed by Elbert H. Gary, chairman of the board of directors, and William E. Corey, president. In the general review of the year the report says:

"During the first 10 months in the year 1907 the several departments of the subsidiary companies were operated at substantially their maximum capacity. The production by the manufacturing properties of finished products for sale during the period from Jan. 1 to Nov. 1, 1907, showed an increase of 5 per cent over the corresponding period in 1906. Owing, however, to the sudden and severe check to general trade conditions which took place in the fall of 1907, the volume of business of the subsidiary companies was materially curtailed, resulting during the last two months of the year in a decrease in production of finished products which exceeded the gain made during the preceding 10 months. The production of finished steel products for sale in the entire year of 1907 shows a decrease compared with 1906 of 201,691 tons, or about 2 per cent. The decrease in actual shipments of products made to customers showed a somewhat larger falling off, 10,451,488 tons of all kinds of manufactured materials (including furnace products and scrap) having been shipped in 1907 against 10,862,425 tons in the preceding year. Prices of steel commodities for domestic sale were not generally advanced during the year notwithstanding there were marked increases in the cost of raw materials and supplies used in manufacturing, in railroad freight charges, in wages, and in taxation charges.

Export Trade.

"The satisfactory results obtained from the export business, through the building up of a permanent and continuous export trade, as noted in previous reports, have continued. During the year there were shipped for export 1,014,082 tons of steel commodities of various kinds, a decrease of 6 per cent as compared with the shipments in the previous year. The gross receipts for the 1907 shipments, however, exceeded those for 1906 by 16 per cent. The average mill price per ton received for all exported materials was only 7½ per cent less than the average price received for all domestic shipments. The advantages to the employes, the domestic consumer, and the manufacturer, of a fair volume of foreign trade during periods of business depression in the United States, have been emphasized in previous reports. In order to obtain the maximum benefits from such trade during times of lesser activity in business in the domestic market, it seems wise to sell continuously in the neutral markets of the world and even at times when foreign trade conditions do not result in prices so

UNITED STATES STEEL CORPORATION AND SUBSIDIARY COMPANIES

EARNINGS BY MONTHS AND QUARTERS FROM JANUARY 1, 1903, TO DECEMBER 31, 1907

MONTH	1903	1904	1905	1906	1907
January	$7,425,775.00	$2,868,212.80	$6,810,846.88	$11,856,375.42	$12,838,703.25
February	7,730,361.12	4,540,672.74	6,629,462.87	10,958,275.20	12,145,814.95
March	9,912,570.92	6,036,346.28	9,585,585.87	13,819,839.50	14,137,973.85
First Quarter	25,068,707.04	13,445,231.82	23,025,895.62	36,634,490.12	39,122,492.05
April	10,905,204.37	6,863,832.95	9,037,924.69	12,581,901.80	14,600,837.97
May	12,744,323.97	6,256,518.65	10,602,187.27	14,041,601.28	16,056,832.06
June	12,992,780.33	6,370,374.13	10,665,004.46	13,501,529.84	14,846,034.82
Second Quarter	36,642,308.67	19,490,725.73	30,305,116.42	40,125,032.92	45,503,704.85
July	12,384,646.83	6,344,770.69	9,035,168.49	12,242,098.07	13,804,167.34
August	10,918,174.03	6,202,957.57	10,986,901.02	13,158,860.10	15,279,172.67
September	9,120,134.10	6,226,203.93	11,218,513.43	12,713,666.08	14,720,945.15
Third Quarter	32,422,954.96	18,773,932.19	31,240,582.94	38,114,624.25	43,804,285.16
October	7,675,140.91	7,250,204.21	12,400,306.52	14,984,925.75	17,052,210.70
November	4,069,901.22	7,117,417.56	11,827,214.98	13,482,464.58	10,467,252.60
December	3,292,139.55	7,099,010.22	10,988,541.95	13,282,735.56	5,014,728.36
Fourth Quarter	15,037,181.68	21,466,631.99	35,216,063.45	41,750,125.89	32,534,191.66
Total for Year	$109,171,152.35	$73,176,521.73	$119,787,658.43	$156,624,273.18	$160,964,673.72

near the domestic prices as were received during 1907.

Purchase of Tennessee Property.

"In November, 1907, the Corporation acquired a majority of the common stock of the Tennessee Coal, Iron & Railroad Co. The purchase was made during the financial panic of October, 1907. The parties owning or controlling a majority of the Tennessee Co.'s stock offered the same to the Corporation on terms which were satisfactory both as to price and manner of payment. The purchase of the property promises benefit to the Corporation and also aided promptly and materially in relieving the financial stress at the time existing. The Tennessee property is very valuable. Its mineral resources are large. The location of the iron ore and coal deposits in the immediate proximity of the manufacturing plants enables the production of iron at reasonable cost. It is believed the lines of business of the Tennessee company can be materially extended. During the last two years about $6,250,000 were expended in rehabilitating, modernizing and enlarging the furnaces and steel plant. Additional expenditures of considerable magnitude in 1908 are contemplated to complete the plans for improvements which were under way when the Corporation acquired the property. It is believed that when these improvements and extensions shall have been completed the business of the company will be profitable.

Expenditures for Improvements.

"The expenditures by subsidiary companies during 1907 for additional property and construction, including the Tennessee company's expenditures for two months only, amounted to $66,981,252.46. Included in this total is $19,343,229.62 for account of the Gary plant in Indiana. The subsidiary companies also made during the year expenditures aggregating $20,324,584.90 for extraordinary replacements. The foregoing expenditures, with the exception of $2,348,301.80 financed by issue of securities and purchase obligations, have been paid for from earnings and surplus income. The properties have been maintained at the highest state of efficiency, and through liberal outlays their production and earning power have been materially increased. At the close of the year a large amount of construction and improvement work was still in progress, being principally the uncompleted portion of the program for extensions and betterments authorized in the early part of 1907. The amount unexpended, Jan. 1, 1908, for these purposes, including those for Tennessee Coal, Iron & Railroad Co., but exclusive of the requirements for the new work at Gary, Ind., referred to below, equaled approximately $40,000,000. It is estimated that about 85 per cent of this total amount can be expended in 1908.

Progress at Gary.

"Substantial progress was made during the year in the construction of the new plant at Gary, the building of the city, and in the terminal railroad work and facilities adjacent to the steel plant. The expenditures made in connection with the foregoing to Dec. 31, 1907, including the cost of about 9,000 acres of land, amounted to $24,063,388.53. This amount has been provided entirely from surplus net profits of the Corporation. Dec. 31, 1907, there was reserved in the special fund set aside and available for the foregoing construction work, a balance of $26,051,242.62. The balance unexpended, Jan. 1, 1908, on appropriations heretofore authorized for this work was $35,517,000. It is believed about $18,000,000 of this amount can be expended during 1908. The following is a brief description of the property and the status of the construction work at Gary.

The Site.

"The property is located at the southern end of Lake Michigan, in Lake county, Ind., 25 miles from the business center of Chicago. The tract contains about 9,000 acres with about 10 miles frontage on the shore of Lake Michigan, and the area will ultimately be increased by filling the present submerged lands adjoining the Lake Michigan shore line. The property is located on, or immediately adjacent to, five trunk lines of railways.

The Manufacturing Plant.

"The steel plant is being constructed on an area of 1,000 acres of the above property fronting on the lake. Ground was first broken in August, 1906. The

MAINTENANCE, RENEWALS AND EXTRAORDINARY REPLACEMENTS

The expenditures made by all companies during the year 1907 for maintenance and renewals, including the relining of blast furnaces, and for extraordinary replacements, equaled the total sum of $55,828,253.12, an increase in comparison with the expenditures for the same purposes during the preceding year of $7,495,163.75, or 15.5 per cent. The expenditures in the year 1907 were the largest of any year in the organization's history. The annual expenditures since 1902 have been as follows:

1902	$29,157,010.73
1903	34,785,191.21
1904	26,258,372.22
1905	37,471,769.63
1906	48,333,089.37
1907	55,828,253.12
Total	$231,833,686.28

The entire amount of the foregoing expenditures was charged to current operating expenses and to replacement funds reserved from earnings. A statement showing the principal items of replacement and betterment comprehended in the total expenditures for extraordinary replacements is included in the statistical tables printed in this report.

The following table shows the amount of the expenditures made during the year for above purposes by the respective groups of operating properties:

EXPENDED ON	*EXPENDITURES DURING YEAR OF 1907*			*Total Expenditures in Previous Year*	*Increase or Decrease*
	Ordinary Maintenance and Repairs, Including Blast Furnace Relining	*Extraordinary Replacements**	*Total*		
Manufacturing Properties					
Total, except Blast Furnace Relining	$23,256,791.26	$14,886,969.81	$38,143,761.07	$32,564,377.85	$5,579,383.22
Blast Furnace Relining	1,481,975.08	.....	1,481,975.08	1,177,017.29	304,957.79
Coal and Coke Properties	1,527,545.74	773,549.51	2,301,095.25	2,625,180.66	*Dec.* 324,085.41
Iron Ore Properties	438,110.56	428,141.74	866,252.30	604,124.42	262,127.88
Transportation Properties					
Railroads	7,863,446.76	3,489,481.86	11,352,928.62	8,053,224.86	3,299,703.76
Steamships and Docks	740,458.53	372,065.58	1,112,524.11	2,560,969.14	*Dec.* 1,448,445.03
Miscellaneous Properties	195,340.39	374,376.30	569,716.69	748,195.15	*Dec.* 178,478.46
Total expended in 1907	$35,503,668.32	$20,324,584.80	$55,828,253.12	.....	.....
Total expended in 1906	30,493,927.73	17,839,161.64	.....	48,333,089.37	.....
Increase	$5,009,740.59	$2,485,423.16	.....	.....	$7,495,163.75

* These expenditures were paid from funds provided from earnings to cover requirements of the character included herein.

CONDENSED GENERAL BALANCE SHEET, DECEMBER 31, 1907

ASSETS

PROPERTY ACCOUNT			
PROPERTIES OWNED AND OPERATED BY THE SEVERAL COMPANIES			
Balance of this account as of December 31, 1906		$1,378,185,605.07	
Additions during 1907 to foregoing balance		614,722.63	
Tennessee Coal, Iron & R. R. Co.'s Properties, viz.			
Cost of Fixed Property as acquired at November 1, 1907	$48,961,208.83		
Expended for Construction in November and December	984,886.74		
		49,046,095.57	
Expended for Additional Property and Construction in 1907 other than by or for account T. C., I. & R. R. Co.		65,996,365.72	
		$1,494,742,788.99	
Less, Charged off to the following accounts, viz.:			
To Bond Sinking Funds	$572,500.00		
To Depreciation, Extinguishment and Replacement Funds	4,680,421.03		
To Funds provided from Surplus Net Income for payment of capital expenditures	53,949,799.46		
		59,202,720.49	
		$1,435,540,068.50	
Expenditures for Stripping and Development at Mines, and Investment in Structural Erection and Logging Plants, viz.:			
Balance at December 31, 1906	$5,722,340.61		
Net Increase during the year 1907	4,575,041.26		
		10,297,381.87	
			$1,445,837,450.37
DEFERRED CHARGES TO OPERATIONS			
Payments for Advanced Mining Royalties, Exploration expenses and Miscellaneous charges, chargeable to future operations of the properties		$6,204,733.85	
Less: Fund reserved from Surplus to cover possible failure to realize Advanced Mining Royalties		2,500,000.00	
			3,704,733.85
INVESTMENTS			
Outside Real Estate and Other Property			**1,717,119.87**
SINKING AND RESERVE FUND ASSETS			
Cash resources held by Trustees account of Bond Sinking Funds ($31,559,000 par value of Redeemed Bonds held by Trustees, not treated as an asset.)		$444,200.88	
Contingent Fund and Miscellaneous Assets		1,215,522.85	
Insurance Fund Assets (at market value)		4,120,158.63	
Depreciation and Extinguishment Fund Assets (at market value)		10,741,977.19	
Investments (at market value) for Special Construction Fund for Gary Plant		15,920,542.14	
			32,442,401.69
CURRENT ASSETS			
Inventories*		$136,188,874.28	
Accounts Receivable		58,308,454.36	
Bills Receivable, Customers' and Guaranteed Loans		10,193,706.91	
Agents' Balances		835,269.33	
Sundry Marketable Bonds and Stocks		8,831,154.32	
Loans on Collateral		6,000,000.00	
Cash, viz.:			
In hand and on deposit with Banks, Bankers and Trust Companies subject to cheque	$51,222,395.07		
Deposits loaned on call	2,741,453.81		
		53,963,848.88	
			274,411,308.08
$1,758,113,013.86			

*Inventory valuations include profits accrued to subsidiary companies on materials and products sold to other subsidiary companies and undisposed of by the latter—see contra specific surplus account for these profits. The total of all inventories is, however, below the actual current market prices.

We have audited the above Balance Sheet, and certify that in our opinion it is properly drawn up so as to show the true financial position of the United States Steel Corporation and Subsidiary Companies on December 31, 1907.

PRICE, WATERHOUSE & CO.,
Auditors.

NEW YORK, March 7, 1908.

LIABILITIES

CAPITAL STOCK OF U. S. STEEL CORPORATION			
Common		$508,302,500.00	
Preferred		360,281,100.00	
			$868,583,600.00
CAPITAL STOCKS OF SUBSIDIARY COMPANIES NOT HELD BY U. S. STEEL CORPORATION (*Par Value*)			**761,810.00**
BONDED AND DEBENTURE DEBT			
United States Steel Corporation 50 Year 5% Bonds	$303,957,000.00		
United States Steel Corporation 10-60 Year 5% Bonds	200,000,000.00		
	$503,957,000.00		
Less, Redeemed and held by Trustees of Sinking Funds	23,758,000.00		
Balance outstanding		$480,199,000.00	
Subsidiary Cos.' Bds. (Guaranteed by U. S. Steel Corp'n)	$48,036,000.00		
Subsidiary Cos.' Bds. (Not guaranteed by U. S. Steel Corp'n)	79,716,904.13		
	$127,752,904.13		
Less, Redeemed and held by Trustees of Sinking Funds	7,801,000.00		
Balance outstanding		119,951,904.13	
Debenture Scrip, Illinois Steel Company		34,366.66	
			600,185,270.79
CAPITAL OBLIGATIONS AUTHORIZED OR CREATED FOR CAPITAL EXPENDITURES MADE (HELD IN THE TREASURY SUBJECT TO SALE, BUT NOT INCLUDED IN ASSETS—			
Subsidiary Companies' Bonds, not included in this Balance Sheet as either a Liability or an Asset		$10,222,000.00	— — —
MORTGAGES AND PURCHASE MONEY OBLIGATIONS OF SUBSIDIARY COMPANIES			
Mortgages		$2,135,240.38	
Purchase Money Obligations		3,258,700.65	
			5,393,941.03
CURRENT LIABILITIES			
Current Accounts Payable and Pay Rolls		$22,506,488.45	
Bills Payable (of Tenn. Coal, Iron & R. R. Co.)		1,052,747.59	
Special Deposits or Loans due employes and others		1,057,495.58	
Accrued Taxes not yet due		3,736,747.80	
Accrued Interest and Unpresented Coupons		7,863,913.57	
Preferred Stock Dividend No. 27, Payable February 29, 1908		6,304,919.85	
Common Stock Dividend No. 17, Payable March 30, 1908		2,541,512.50	
			45,063,824.74
Total Capital and Current Liabilities			**$1,519,988,446.56**
SINKING AND RESERVE FUNDS			
Sinking, Depreciation and Replacement Funds		$41,360,655.19	
General Construction Fund for authorized appropriations		3,923,814.96	
Special Construction Fund for account Gary, Ind., Plant		26,051,242.62	
Contingent and Miscellaneous Operating Funds		7,991,275.89	
Insurance Funds		4,648,358.57	
			83,975,347.23
BOND SINKING FUNDS WITH ACCRETIONS Represented by Cash (and by redeemed bonds not treated as assets—See Contra)			**31,503,976.45**
UNDIVIDED SURPLUS OF U. S. STEEL CORPORATION AND SUBSIDIARY COMPANIES			
Capital Surplus provided in organization		$25,000,000.00	
Balance of Surplus accumulated by all companies from April 1, 1901, to December 31, 1907		69,736,490.77	
Total Surplus exclusive of Subsidiary Companies' Inter-Company Profits in Inventories		$94,736,490.77	
Undivided Surplus of Subsidiary Companies, representing Profits accrued on sale of materials and products to other subsidiary companies and on hand in latter's Inventories		27,908,752.85	
			122,645,243.62
			$1,758,113,013.86

plant construction authorized to date is as follows:

"Eight 450-ton per day blast furnaces, with the necessary vessel slip, ore unloading and storing facilities, power houses, pig casting plant and other auxiliaries; fifty-six 60-ton open-hearth furnaces, estimated to produce 225,000 tons of ingots per month; rail mill, estimated to produce 100,000 tons of rails per month; billet mill, estimated to produce 100,000 tons of billets per month; 48-inch universal plate mill; 160-inch sheared plate mill; merchant mills, with a capacity of 50,000 tons per month; complete equipment of mechanical shops; office building.

"The general plans adopted provide various departments in this plant which will permit increasing the number of blast furnaces to 16, and the steel producing and rolling capacity accordingly.

Progress in Construction Work.

"The progress made in the construction work to date is as follows:

"The vessel slip, which is 250 feet wide and is to extend inland 3,000 feet and from the shore line into the lake 2,000 feet, has been excavated to approximately 2,500 feet inland; the two docks forming the sides of the slip extending into the lake are well under way, the piling and sheeting having been placed for nearly the entire distance.

"The ore unloaders are erected complete, and the ore bridges and bins are in process of erection.

"The iron work on four blast furnaces is nearing completion, and the foundations for the second four are ready to receive the iron work.

"The blowing engines for the first four furnaces, comprehending eight gas-driven and two steam-driven engines, are under process of erection. The foundations have been started for the blowing engines for the second four furnaces.

"The electric power plant, which is to furnish power for driving all of the mills in the plant; also for pumping water and for lighting the city of Gary, includes a power house 969 feet long by 107 feet wide, one-half of which is now erected, together with the foundations for nine gas engines and two steam turbines. The foundations for the remainder of the building and machinery are well under way. There will be installed in this plant in all seventeen 3,000-horsepower gas-driven generators and two 2,500-horsepower steam turbine-driven generators. It is believed this is the largest installation in one unit of gas engines that has ever been made.

"In the steel producing department, one open-hearth unit, consisting of fourteen 60-ton furnaces, with hot metal mixer and other auxiliaries, is nearing completion, and the foundations for the second similar unit are completed and erection of the steel work has been started.

"On the rail mill the foundations and

INCOME ACCOUNT FOR THE YEAR 1907

(Including operating results of Tennessee Coal, Iron & R. R. Co. for months of November and December)

The total earnings of all properties after deducting all expenses incident to operations, including those for ordinary repairs and maintenance (approximately $35,000,000), employes' bonus and pension funds, and also interest on bonds and the fixed charges of the subsidiary companies, amounted to			$160,964,673.72
Less: Appropriations for the following purposes, viz.:			
Sinking Funds on Bonds of Subsidiary Companies		$1,977,761.03	
Depreciation and Extinguishment Funds (regular provisions for the year)		6,681,746.03	
Extraordinary Replacement Funds (regular provisions for the year)		15,560,237.38	
Special Replacement and Improvement Funds		3,500,000.00	
			27,719,744.44
Net Earnings in the year 1907			$133,244,929.28
Deduct:			
Interest on U. S. Steel Corporation Bonds outstanding, viz.:			
Fifty Year 5 per cent. Gold Bonds		$14,341,018.37	
Ten-Sixty Year 5 per cent. Gold Bonds		8,519,334.45	
Sinking Funds on U. S. Steel Corporation Bonds, viz.:			
Installment on 50 Year 5 per cent. Gold Bonds	$3,040,000.00		
Installment on 10-60 Year 5 per cent. Gold Bonds	1,010,000.00		
Interest on above Bonds in Sinking Funds	1,087,497.18		
		5,137,497.18	
			27,997,850.00
			$105,247,079.28
Less, Charged off for adjustments in sundry accounts			681,515.52
Balance			$104,565,563.76
Dividends for the year 1907 on U. S. Steel Corporation Stocks, viz.:			
Preferred, 7 per cent		$25,219,677.00	
Common, 2 per cent		10,166,050.00	
			35,385,727.00
Surplus Net Income for the year			$69,179,836.76
Less, Appropriated from Surplus Net Income for the following purposes, viz.:			
On account of expenditures made and to be made on authorized appropriations for additional property, new plants and construction, and for discharge of capital obligations		$35,500,000.00	
Specifically set aside for authorized appropriations and expenditures account construction Gary, Indiana, Plant		18,500,000.00	
			54,000,000.00
Balance of Surplus for the year			$15,179,836.76

UNDIVIDED SURPLUS OF U. S. STEEL CORPORATION AND SUBSIDIARY COMPANIES

(Since April 1, 1901)

Surplus or Working Capital provided in organization		$25,000,000.00
Balance of Surplus accumulated by all companies from April 1, 1901, to December 31, 1906, per Annual Report for year 1906, exclusive of subsidiary companies' inter-company profits in Inventories	$54,556,654.01	
Undivided Surplus of all companies for the year 1907	15,179,836.76	
		69,736,490.77
Total Undivided Surplus, December 31, 1907, exclusive of subsidiary companies inter-company profits in Inventories		$94,736,490.77
Undivided Surplus of Subsidiary Companies, representing profits accrued on sales of materials to other subsidiary companies and on hand in the latter's inventories, viz.:		
Balance on December 31, 1906, per Annual Report	$18,164,060.34	
Add, Increase during the year 1907	9,744,692.51	
Balance December 31, 1907		27,908,752.85
Total Undivided Surplus, December 31, 1907		$122,645,243.62

the building are nearing completion, and the erection of the machinery is well advanced.

"On the billet mill a part of the excavation and foundation work has been completed. Seventy-five per cent of the machinery for this mill has been contracted for and is now being constructed.

"For the plate mills and merchant mills the plans have been completed.

"The shop equipment, including machine shop, boiler shop, foundry, blacksmith shop, carpenter and pattern shop, pattern storage shop, roll shop and general store building, is practically completed and in operation.

"The office building has been completed.

The City of Gary.

"Approximately 800 acres of the property acquired, lying immediately south of the mill site and separated from it by the Grand Calumet river, has been platted into about 4,000 lots and incorporated as the first subdivision of the city of Gary. This subdivision will contain more than 25 miles of paved and macadamized streets. To date 25,250 lineal feet of streets have been paved, and 37,000 lineal feet of sidewalks laid.

"A sewer system consisting of a discharge main of 96 inches in diameter, with lateral branches 60 inches, 54 inches and 36 inches respectively in diameter, has been installed, having a total length of 97,000 lineal feet. Ninety-one thousand lineal feet of water pipe have been laid in the first subdivision and temporary pumps installed, which are now furnishing the water supply from driven wells. There is under construction a permanent water works pumping station which contemplates the construction of a water tunnel 72 inches in diameter, 15,000 feet long, extending into the lake 7,000 feet from the present shore line.

"A gas plant, with a capacity of 300,000 cubic feet of water gas per day, is completed and in operation. Seventy-one thousand lineal feet of gas pipe have been laid in the first subdivision. An electric lighting plant, furnishing both incandescent and arc lights, has been installed and is in operation, current being furnished temporarily from lines connecting with the Illinois Steel Co.'s electric generating plant at South Chicago.

"Approximately 500 dwelling houses have been erected. Many of these houses are now occupied. In addition to the dwelling houses, the following public buildings have been erected and are now occupied: One hotel building, containing 40 rooms; one restaurant; two lodging houses; school house containing nine rooms.

"All of the above development and construction work in the city of Gary has been carried on by the Gary Land Co., a subsidiary company of this corporation.

"Residence and business lots have been offered for sale, with the requirement that buildings of an approved character be erected thereon within 18 months after purchase. Under this plan approximately 240 lots have been sold, largely in business districts. On the principal business street in the first subdivision there have been constructed by purchasers of lots about 40 business blocks, the estimated cost of which is $600,000 or more. Most of these buildings have been completed and are now occupied by stores of various kinds, two banks and offices.

Terminal Railroad Work.

"The main lines of the Baltimore & Ohio Railroad Co. and the Indiana Harbor Railroad Co. ran directly through the manufacturing mill site. In order to remove these lines of railroad from the mill site and to permit the construction of a sufficiently large and properly located railroad yard for use in connection with the steel plant, an agreement was entered into by the various railway companies concerned

CONDENSED GENERAL PROFIT AND LOSS ACCOUNT

For year ending December 31, 1907

GROSS RECEIPTS—Gross Sales and Earnings		$757,014,767.68
Less, Manufacturing and Producing Cost and Operating Expenses		*564,166,777.12
Balance		$192,847,990.56
Sundry Net Manufacturing and Operating Gains and Losses, including Idle Plant expenses, Royalties received, Depreciation in inventory valuations, etc.	$2,567,150.85	
Rentals received	699,058.60	3,266,209.45
Total Net Manufacturing, Producing and Operating Income		$196,114,200.01
OTHER INCOME		
Net Profits of Properties owned, including those of T. C., I. & R. R. Co. for two months, but whose operations (gross revenue, cost of product, expenses, etc.) are not included in this statement	$1,737,939.35	
Interest and Dividends on Investments and on Deposits, etc.	4,744,801.62	6,482,740.97
Total Income		$202,596,940.98
GENERAL EXPENSES		
Administrative, Selling and General Expenses, and Employes' Bonus and Pension Funds (not including general expenses of transportation companies)	$15,945,436.84	
Taxes	5,383,923.95	
Miscellaneous Expenditures and Charges (Net)	114,008.89	
Commercial Discounts and Interest	3,932,009.65	25,395,379.33
Balance of Income		$177,201,561.65
INTEREST CHARGES		
Interest on Bonds and Mortgages of the Subsidiary Companies	$6,368,163.30	
Interest on Purchase Money Obligations and Special Deposits or Loans of the Subsidiary Companies	124,031.92	6,492,195.42
Balance, being the aggregate earnings of the several companies for the year		$170,709,366.23
Less, Profits earned by subsidiary companies on sales made and service rendered account of materials on hand in purchasing companies' inventories, and which profits have not yet been realized in cash from the standpoint of a combined statement of the business of the U. S. Steel Corporation and subsidiary companies		9,744,692.51
Earnings for the Year 1907, per Income Account		$160,964,673.72

*Includes charges for ordinary maintenance and repairs, approximately $35,000,000.

COMPARATIVE INCOME ACCOUNT

For the Fiscal Years ended December 31, 1907 and 1906

	1907	1906	*Increase or Decrease*
EARNINGS	$160,964,673.72	$156,624,273.18	$4,340,400.54 Inc.
Less, Appropriations for the following purposes, viz.:			
Sinking Funds on Bonds of Subsidiary Companies	1,077,761.03	1,904,063.50	73,697.53 Inc.
Depreciation and Extinguishment Funds (regular provisions for the year)	6,681,746.03	5,857,410.91	824,335.12 Inc.
Extraordinary Replacement Funds (regular provisions for the year)	15,560,237.38	15,395,860.64	164,376.74 Inc.
Special Replacement and Improvement Funds	3,500,000.00	7,500,000.00	4,000,000.00 Dec.
Net Earnings in the Year	$133,244,929.28	$125,966,938.13	$7,277,991.15 Inc.
Deduct:			
Interest on U. S. Steel Corporation Bonds outstanding	22,860,352.82	22,839,849.98	20,502.84 Inc.
Sinking Funds on U. S. Steel Corporation Bonds, viz.:			
Installments	4,050,000.00	4,050,000.00	.....
Interest on Bonds in Sinking Funds	1,087,497.18	858,000.02	229,497.16 Inc.
	$105,247,079.28	$98,219,088.13	$7,027,991.15 Inc.
Less, Charged off for various accounts and adjustments	681,515.52	90,501.19	591,014.33 Inc.
Balance	$104,565,563.76	$98,128,586.94	$6,436,976.82 Inc.
Dividends on U. S. Steel Corporation Stocks, viz.:			
Preferred, 7 per cent.	25,219,677.00	25,219,677.00	.....
Common, 2 per cent.	10,166,050.00	10,166,050.00	.....
Surplus Net Income for the Year	$69,179,836.76	$62,742,859.94	$6,436,976.82 Inc.
Appropriated from Surplus Net Income for the following purposes, viz.:			
On account of expenditures made and to be made on authorized appropriations for additional property, new plants and construction, and for discharge of capital obligations	35,500,000.00	28,500,000.00	7,000,000.00 Inc.
Specifically set aside for authorized appropriations and expenditures account construction Gary, Indiana, Plant	18,500,000.00	21,500,000.00	3,000,000.00 Dec.
Balance of Surplus for the Year	$15,179,836.76	$12,742,859.94	$2,436,976.82 Inc.

whereby the main lines of the Baltimore & Ohio Railroad Co. and the Indiana Harbor Railroad Co. were changed so as to run south of the mill site. This changing of the main lines of the companies named also involved a change in the main line of the Lake Shore & Michigan Southern Railway Co. and the construction of a new line of railway from a connection with the Indiana Harbor railroad east of the mill site, southwestwardly and westerly passing to the south of the city of Gary, to the town of Gibson, where a connection is again made with the Indiana Harbor railroad.

"A great deal of clearing, grading and filling, and track laying has been done in connection with the foregoing rearrangement and construction of railroad lines. Upon the completion of the work an adjustment of the expenditure is to be made between all of the companies interested.

"Within the steel plant of the Indiana Steel Co., 41.6 miles of standard gage yard tracks have been laid. Outside of and adjacent to the steel plant to the westward the large railroad yard known as Kirk yard is under construction by a subsidiary company. In this work approximately 21 miles of tracks have already been laid and additional grading done to take care of necessary additional tracks for some time to come. At the eastern end of this yard substantial progress has been made in the construction of a large roundhouse, coal chutes and power house.

Duluth Steel Plant.

"There has been purchased a site containing about 1,580 acres (of which 300 acres are now submerged) located in St. Louis county, Minn., 10 miles from the center of the city of Duluth, on which it is proposed to construct a moderate-sized iron and steel plant. The tract fronts on the St. Louis river, which is navigable for large lake steamers, and is located on the line of the Northern Pacific railway. It is expected, however, that there will be constructed in connection with the steel plant a belt railway extending northwardly therefrom to a connection with the Duluth, Missabe & Northern railway to enable the prompt and economical delivery of ore to the plant from the Minnesota ore ranges; also eastwardly from the steel plant across the St. Louis river into Superior, Wis., where connections will be made with five trunk lines of railways reaching the head of Lake Superior from the south and west. It is proposed to have the plant constructed by the Minnesota Steel Co., a subsidiary corporation. The plans for the scope and construction of the steel plant have not yet been fully developed. The expenditures on account of this property during 1907 include the purchase of the real estate and some clearing and leveling of the site.

Pension Fund.

"Reference was made in the last annual report to the proposal to establish from the employes' bonus fund for 1907 a separate fund to be used for pension purposes. Accordingly there was reserved for this purpose the sum of $1,000,000. The plan under which the benefits accruing from this pension fund will be extended to employes is under consideration.

Unfilled Orders.

"During the first six months of 1907, orders for steel products were received equaling substantially the maximum capacity of the mills. Subsequently there was a marked falling off in the new business offered. As a result the tonnage of unfilled orders on the books at Dec. 31, 1907, was only 4,624,553 tons of all kinds of manufactured steel products. In common with other lines of industry there was a materiai reduction in sales during the latter part of 1907. However, the

INVENTORIES

The book valuation of the inventories of all of the properties at December 31, 1907, aggregated $136,188,874, in comparison with a total at close of preceding year of $119,897,467, an increase of $16,291,407. This increase in the total figures is due in part to including this year the Tennessee Coal, Iron & Railroad Company's inventories, amounting to $2,507,804, but principally to the increased quantity of iron ore in stock. The tonnage of this commodity on hand at furnaces and lower lake docks was 27 per cent. greater than at December 31, 1906. The average price at which the same was inventoried is also somewhat higher than the price used at close of preceding year. The diminution in operations which began in November, 1907, resulted somewhat in adding to the tonnage of ore on hand, but it was the intention to have on hand a larger supply than usual. The diminution in operations above mentioned also accounts to some extent for the increased inventory of fuels, fluxes and refractories, manufacturing and operating supplies, and finished products on hand.

Inventories were taken on the basis of actual purchase or production cost of materials to the respective companies holding the same, unless such cost was above the market value on December 31, 1907, in which case the market price was used. The aggregate inventory valuation of all raw, partly finished and finished materials produced within the organization is much below the market price on December 31, 1907. Inventory valuations do, however, include the profits on materials embraced in inventories which have been purchased by one subsidiary company from another; but, as shown by the General Balance Sheet, such profits are segregated and carried in a specific surplus account, and will not be included in the reported earnings of the entire organization until such profits shall have been converted into cash or a cash asset to the organization. The specific surplus account referred to is, therefore, practically a guarantee fund for these profits so locked up in inventories pending realization in cash.

The following is a general classification of the inventory valuations at December 31, 1907, in comparison with December 31, 1906:

		Dec. 31, 1907	Dec. 31, 1906
Ores		$58,984,718	$42,330,919
Pig Iron, Scrap, Ferro and Spiegel		6,417,224	7,071,656
Coal, Coke and Other Fuel		2,697,728	1,610,161
Copper, Nickel, Aluminum and Alloys		358,482	662,626
Pig Tin, Lead, Zinc, Spelter, Dross and Skimmings		3,146,385	5,958,744
Limestone, Fluxes and Refractories		2,243,268	1,455,996
Rolls, Molds and Stools		4,331,139	3,638,855
Manufacturing Supplies, Stores and Sundry Items not otherwise classified		11,569,216	10,133,018
Ingots—Steel and Nickel		451,552	750,146
Blooms, Billets, Slabs, Sheet and Tin Bars, etc		6,416,619	5,785,217
Wire Rods		709,060	714,517
Skelp		1,212,483	1,502,314
Finished Products		24,868,713	21,626,657
Mining Supplies and Stores (for ore and coal properties)		3,101,742	2,793,688
Railroad Supplies and Stores		4,979,707	2,167,005
Merchandise of Supply Companies		797,115	702,154
Material, labor and expense locked up in Bridge and Structural contracts	$28,062,568		
Less, Bills rendered on account	25,768,465		
		2,294,103	4,054,060
Stocks abroad and on consignment		1,806,138	1,380,890
Material in Transit		1,803,482	5,498,844
Total		$136,188,874	$119,897,467

PRODUCTION

The production of the several properties for the year, exclusive of that of the Tennessee Coal, Iron & R. R. Co., in comparison with the results for the fiscal year of 1906, was as follows:

Products	1907	1906
IRON ORE MINED	Tons	Tons
From Marquette Range	1,170,496	1,442,890
From Menominee Range	1,625,358	1,874,680
From Gogebic Range	1,425,457	1,465,375
From Vermilion Range	1,724,217	1,794,186
From Mesaba Range	16,458,273	14,068,617
Total	22,403,801	20,645,148
COKE MANUFACTURED	12,373,938	13,295,075
COAL MINED, not including that used in making Coke	1,841,259	1,912,444
LIMESTONE QUARRIED	2,957,163	2,227,436
BLAST FURNACE PRODUCTS		
Pig Iron	10,631,620	11,058,526
Spiegel	130,554	150,044
Ferro-Manganese and Silicon	57,794	58,807
Total	10,819,968	11,267,377
STEEL INGOT PRODUCTION		
Bessemer Ingots	7,556,460	8,072,655
Open-Hearth Ingots	5,543,088	5,438,494
Total	13,099,548	13,511,149
ROLLED AND OTHER FINISHED PRODUCTS FOR SALE		
Steel Rails	1,733,814	1,982,042
Blooms, Billets, Slabs, Sheet and Tin Plate Bars	758,609	1,000,727
Plates	877,682	836,399
Heavy Structural Shapes	587,954	620,823
Merchant Steel, Skelp, Hoops, Bands and Cotton Ties	1,316,387	1,240,548
Tubing and Pipe	1,174,629	1,025,913
Rods	126,095	111,488
Wire and Products of Wire	1,481,226	1,399,717
Sheets—Black, Galvanized and Tin Plate	1,070,752	1,112,542
Finished Structural Work	719,887	643,622
Angle and Splice Bars and Joints	195,157	176,730
Spikes, Bolts, Nuts and Rivets	67,991	70,233
Axles	180,006	181,913
Sundry Iron and Steel Products	77,463	79,736
Total	10,376,742	10,578,433
Spelter	31,454	28,884
Copperas (Sulphate of Iron)	24,540	21,933
	Bbls.	Bbls.
Universal Portland Cement	2,129,700	2,076,000

bookings for January were 25 per cent better than December, and for February 25 per cent better than January. As this report goes to press the bookings per day are at least 25 per cent larger than those of February. The management express hopeful views of the future.

"The board takes pleasure in acknowledging the loyal and efficient services of the officers and employes of the Corporation and the several subsidiary companies."

Employes' Subscriptions to Preferred Stock.

In January, 1908, there was again offered to the employes of the United States Steel Corporation and of the subsidiary companies the privilege of subscribing for 25,000 shares of preferred stock on substantially the same conditions as offered previously, except the price was fixed at $87.50 per share. The offer was oversubscribed by about 100 per cent, applications having been received from 24,884 employes for an aggregate of 50,075 shares. Allotments were made as follows: Each subscriber for one share was allotted the same, and all others were allotted 50 per cent of their subscriptions. The total number of shares allotted on this basis was 30,621.

Balance Sheet, Statements of Accounts and Statistics.

The statements of accounts, statistics, etc., presented in the report comprehend, unless otherwise specifically stated, the combined results of the United States Steel Corporation and all of the subsidiary companies, including the Tennessee Coal, Iron & Railroad Co. In respect of this latter company, however, its operating results, wherever included in combined statements, cover only its operations since Nov. 1, 1907, the date as of which the United States Steel Corporation acquired a majority interest in the stock of said company.

The condensed balance sheet exhibits the combined assets and liabilities of the United States Steel Corporation and of the several subsidiary companies, based on the valuations at which the stocks of the subsidiary companies and the Carnegie Co. bonds were acquired by the Steel Corporation, but *liabilities from one company to another are omitted from both liabilities and assets.* This combined balance sheet for Dec. 31, 1907, takes up under their respective headings the assets and outstanding liabilities of the Tennessee Coal, Iron & Railroad Co.; also the proportionate part of the assets and liabilities of the Hostetter-Connellsville Coke Coal Co., applicable to the stock of that company which was not previously owned by Steel Corporation interests. The inclusion of these last-named assets and liabilities accounts for substantially all of the items of additions of $614,722.63 under the heading of property account. The increase of $738,410, as compared with Dec. 31, 1906, in the outstanding stocks of subsidiary companies not held by United States Steel Corporation, is made up of $220,160 of common and $124,500 of preferred stock of Tennessee Coal, Iron & Railroad Co., $193,000 of preferred stock of Alabama Steel & Shipbuilding Co. (a subsidiary of the T. C., I. & R. R. Co.), and $203,750 of Hostetter-Connellsville Coke Co. stock, —total $741,410, less $3,000 of subsidiary companies' stocks outstanding at close of 1906 acquired during the year.

Inventories.

The book valuation of the inventories of all properties of the United States Steel Corporation, Dec. 31, 1907, aggregated $136,188,874.00 in comparison with a total at the close of the preceding year of $119,897,466.00, an increase of $16,291,407.00. The increase in the total figures is due in part to including inventories of the Tennessee Coal, Iron & Railroad Co. amounting to $2,507,804.00 and principally to the increased quantity of iron ore in stock. The tonnage of this commodity at furnaces and lower lake docks was 27 per cent greater on Dec. 31, 1907, than the previous year. The average price at which the same was inventoried is also somewhat higher than the price used at the close of the previous year. The diminution in operation which began in December, 1907, resulted somewhat in adding to the tonnage of ore on hand, but it was the intention to carry a larger supply than usual.

Wage Increase.

On Jan. 1, 1907 (on March 1, 1907, in case of the coke companies), an advance was made in the wages and salaries of approximately 65 per cent of the total employes of all companies. This advance increased the wages and salaries of the employes affected about 6-6/10 per cent. The average rate of wages and salaries paid all employes during 1907 was above 5 per cent higher than the similar average rate in the next preceding year.

Employes and Pay Rolls.

The average number of employes in the service of all companies during the fiscal year of 1907, in comparison with the fiscal year of 1906, was as follows:

Employes of	1907. Number.	1906. Number.
Manufacturing properties	151,670	147,048
Coal and coke properties	21,447	21,929
Iron ore mining properties	16,462	14,393
Transportation properties	18,133	16,638
Miscellaneous properties	2,468	2,449
Total	210,180	202,457
Total annual salaries and wages	$160,825,822	$147,765,540

Capital Expenditures.

The expenditures made during the year, chargeable to capital account for the acquisition of additional property and construction, less credits for property sold, but exclusive of the amount paid by the United States Steel Corporation for the purchase of the stock of the Tennessee Coal, Iron & Railroad Co., equals the sum of $66,981,252.46. The capital expenditures are classified by the property groups as follows:

CAPITAL EXPENDITURES.

Gary, Indiana, Plant, the City of Gary, and terminal railroad work adjacent thereto	$19,343,229.62
All other Manufacturing Properties except Tennessee Coal, Iron & Railroad Company	23,329,673.09
Tennessee Coal, Iron & Railroad Company (for months of November and December, 1907)	984,886.74
Coal and Coke Properties	4,093,283.65
Iron Ore Properties	5,854,797.07
Transportation Properties	13,194,074.61
Miscellaneous Properties	181,307.68
Total for the year 1907	$66,981,252.46
Amount expended for additional property and construction from April 1, 1901, to January 1, 1907	139,094,037.49
Making a grand total expended to January 1, 1908, of	$206,075,289.95

The funds for the payment of the expenditures made during the year 1907, as above, have been provided from the following sources, viz.:

From Bonds, Mortgages and Purchase Obligations issued and disposed of during the year	$2,348,301.80
From Depreciation, Replacement and Sinking Funds appropriated for payment of expenditures included therein	3,786,854.15
From General Construction Fund appropriated from surplus net income	33,793,009.67
From Special Construction Fund appropriated from surplus net income for account Gary, Indiana, Plant	19,316,555.27
And the balance has been advanced from the general surplus account as an investment thereof in Property Account	7,736,531.57
Total	$66,981,252.46

Acquisition of Tennessee Coal, Iron & Railroad Co.

In and since November, 1907, the Corporation acquired $30,374,825 par value, of the common stock and of common stock subscription receipts of the Tennessee Coal, Iron & Railroad Co., being all but $220,160 of the total of said common stock and common stock subscription receipts issued and outstanding Dec. 31, 1907.

Of the foregoing aggregate of $30,374,825, par value, of common stock and common stock subscription receipts acquired, $29,742,170 of same were purchased at par, the Corporation delivering in payment therefor its ten-sixty year five per cent sinking fund gold bonds, as the equivalent of cash at the rate of $11,904.76, par value, of said bonds for $10,000, par value, of Tennessee Coal, Iron & Railroad Co.'s common stock; the balance of $632,655 of said stock acquired was paid for in cash, being the installment of 20 per cent payable Dec. 15, 1907, on the common stock subscription receipts. The total cost to the Corporation of the stock acquired as above was as follows:

	Par value of T. C., I. & R.R. Co. common stock acquired.	Ten-Sixty bonds at par delivered in payment thereof.	Par value of bonds issued, and cost of bonds purchased, for delivery per preceding; also amount of cash payment made.
For full paid common stock certificates	$29,109,515	$34,654,000	$33,949,282.48
For common stock subscription receipts, 20 per cent paid	632,655	753,000	735,695.16
Total paid for with bonds	$29,742,170	$35,407,000	$34,684,977.64
For 20 per cent installment paid Dec. 15, 1907, on subscription receipts	632,655	.....	(Cash) 632,655.00
Total acquired and cost of the same	$30,374,825	$35,407,000	$35,317,632.64

Of the ten-sixty year five per cent sinking fund gold bonds delivered as above, $30,000,000 thereof were bonds of this issue held in the Corporation's treasury, which had been executed and certified in 1903, as authorized by the directors and stockholders. The balance of the bonds delivered for the purpose aforesaid was acquired by the Corporation through purchase in the open market.

As appears from its books the outstanding stocks, bonded debt and purchase money obligations of the Tennessee Coal, Iron & Railroad Co., other than its common stock acquired by the U. S. Steel Corporation as above recited, are as follows:

Common stock	$ 220,160
Preferred stock (cumulative 8 per cent dividend)	124,500
Preferred stock of Alabama Steel & Ship Building Co. (6 per cent guaranteed dividend)	193,000
Various issues of secured bonds aggregating	14,226,000
Purchase money obligations (secured by deposit of Birmingham Southern R. R. Co. stock as collateral)	826,386

The company also had outstanding at Nov. 1, 1907, bills payable, originally issued for funds obtained for construction purposes, amounting to $1,634,311.88.

Tennessee Company's Properties.

The properties of the Tennessee Coal, Iron & Railroad Co. and its subsidiary conmpanies are located in the states of Alabama, Tennessee and Georgia, and are briefly reported as follows:

Manufacturing Properties.

BLAST FURNACES.

	No. of stacks.
At Ensley, Alabama	6
At Bessemer, Alabama	5
At Oxmoor, Alabama	2
At Birmingham, Alabama	1
At South Pittsburg, Tenn.	2
	16

ENSLEY STEEL WORKS, ENSLEY, ALA.—100 acres of mill property on which are located the six blast furnaces named above; also four 60-ton and four 50-ton basic open-hearth steel furnaces; one 250-ton metal mixer; two 20-ton removable acid bessemer converters; one 44-inch blooming mill; one rail mill; iron foundry; steel foundry; brass foundry; machine shop, and other auxiliary departments. There are now under construction two additional 60-ton basic open-hearth steel furnaces.

BESSEMER ROLLING MILLS, BESSEMER, ALA.—Eleven acres of mill property on which are located one 72-inch plate mill and one 8-inch and one 16-inch merchant mill.

Birmingham Southern Railroad Co.

(Capital stock owned by the Tennessee Coal, Iron & Railroad Co.)

Terminal railroad connecting the various mines and plants of the Tennessee Co. in the Birmingham district with diverging trunk lines. The railroad company owns 31.16 miles of main and branch lines, one mile second track, and 67.78 miles of yard and siding tracks. Its equipment consists of 35 locomotives and 725 cars of various classes.

Land Companies

The Tennesse Coal, Iron & Railroad Co. owns the entire issues of capital stocks of the Tennessee Land Co. and Booker City Land Co., also a controlling interest in the stock of the Ensley Land Co. These land companies own various tracts of land adjoining the several properties of the Tennessee Co.

Tennessee Co.'s Mines.

IRON ORE, COAL AND LIMESTONE PROPERTY.
Acreage owned in fee.

	Surface and mineral rights.	Mineral rights only.	Surface only.	Total acreage owned.
In the state of Alabama	165,096	170,152	5,015	340,263
In the state of Tennessee	98,842	6,898	.....	105,740
In the state of Georgia	1,053	367	.....	1,420
Total	264,991	177,417	5,015	447,423

The following developments and improvements have been made on the above properties, viz.:

IRON ORE MINES.

Red ore—On Red Mountain, near Birmingham, Alabama.
Muscoda group, 5 active and 1 inactive mines.
Fossil group, 4 active mines.
Ishkooda group, 2 active mines and 2 under construction.
Green Springs, 1 active mine.
Potter, 1 mine under construction.
Brown ore—
At Greeley, Ala., 3 active mines.
At Bartow, Ga., 2 active mines.

COAL AND COKE PROPERTIES.

	Coal Mines.	Coke Ovens.
At Pratt Mines, Ala.	10 active	1,080
At Blocton, Ala.	3 "	467
At Blue Creek, Ala.	4 "	290
At Blossburg, Ala.	3 "	...
At Birmingham, Ala.	..	251
At Bessemer, Ala.	..	716
At Gamble Mines, Ala.	1 "	...
At Henry Ellen, Ala.	1 "	...
At Whitwell, Tenn.	1 "	100
At Victoria, Tenn.	..	70
Total active coal mines and coke ovens	23	2,974

There is now being opened and under construction at Pratt Mines, one additional mine. At the coal mines the company has eleven coal washing plants with a daily capacity of 10,000 net tons.

STONE QUARRIES.

Dolomite—
At Ketona, Ala.—1 active quarry and one in course of development.
Limestone—
At Calcis, Ala.—1 quarry (inactive at present).
At Banns, Ala.—1 quarry.

Production.

During the year 1907 the production of the mineral and manufacturing properties of the Tennessee company was as follows:

	Gross tons.
Iron ore	1,576,757
Limestone and dolomite	244,059
	Net tons.
Coal (not including that used in making coke)	1,709,251
Coke	1,170,826
Pig iron.	Gross tons.
For market	315,573
For conversion at steel works	287,254
	602,827

	Gross tons.
Open-hearth steel ingots	243,444
Steel rails	146,171
Billets, plates and bars	88,009

(Continued on page 597.)

STANDARD DESIGNS AND CONSTRUCTION OF LARGE GAS ENGINES---I

By F. E. Junge.

This discussion will be strictly limited to such types of large gas engines as have actually been built and have rendered continuous service under the severest conditions of actual practice, the satisfactory results attained justifying their presentation as a standard mechanism.

Economic Attainments; Gas Versus Steam.

Before taking up the subject of design and construction it may be well to summarize briefly those data on the economy of gas engines compared to steam machinery as have been established within the course of the last few years beyond debate. A detailed comparison between the relative economic efficiencies of gas and steam engines, for purposes of pronouncing the superiority of one prime mover over the other, being useless though often drawn, because variations in the plant load curve will change the rerespective efficiencies by 50 per cent and more, it is sufficient to remember that, in modern steam engine practice, of 100 units of heat introduced as fuel into the boiler, 24 per cent is lost through radiation and gas flux to the chimney, 12.7 to 16.7 per cent, the latter with superheating, is utilized as effective work, while the rest is lost in the condenser. In the gas engine we have though the generation of gas in the producer (unless waste gases are used), a loss of about 16.5 per cent through cooling water an additional loss of 21.5 per cent, through exhaust gases another 21.5 per cent, while from 19 to 23.2 per cent is obtained as useful or available work. Fig. 1 shows diagramatically the relative economic efficiency of modern steam and gas engines and the losses occurring through the conversion of combustible matter into work, in the respective processes.

Fig. 2 shows the characteristics and heat values of blast furnace and coke oven gases, in which we are here specially interested, and their relation to other combustible gases. It is obvious that the superiority of gas power over steam power will be most pronounced in the case of the utilization of metallurgical and other gases, formed as products of distinct operations, because then the gas producer losses drop out of the comparison. It will be noted further that the high hydrogen content of coke oven gas compared to blast furnace gas must introduce fundamental differences in the design of engines fit for their use.

The low heat value of the lean blast furnace gases has established the desirability and profitableness of using high compression pressures in the cylinder, and the danger of premature ignition when using coke oven gas has led to the necessity of creating special forms of combustion chambers, which would give ample cooling surface and at the same time would avoid the possibility of excessive heating of projecting points or of foreign matter accumulating in corners and recesses. It is a remarkable achievement of modern gas engine design that it has enabled us to use gases of so widely varying characteristics in the same type of prime mover, through direct combustion.

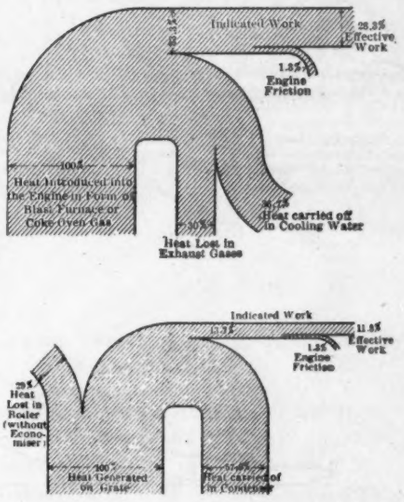

Indicated Work
28.2% Effective Work
1.2% Engine Friction
100%
Heat Introduced into the Engine in Form of Blast Furnace or Coke Oven Gas
30%
Heat carried off in Cooling Water
Heat Lost in Exhaust Gases
Indicated Work
11.8% Effective Work
1.2% Engine Friction
29% Heat Lost in Boiler (without Economiser)
100% Heat Generated
47.0% Heat carried off in Condenser

Fig. 1—Diagram Showing Relative Losses in Gas and Steam Engines.

Discussion of Combustion Cycles.

It is unnecessary here to dwell at length on a consideration of the respective merits of practical working cycles, since the standard machines of today all operate with what we term "constant volume combustion," carrying out the complete series of processes, charging, compressing, expanding and exhausting, either during four successive strokes of the piston (Otto cycle), or by the aid of separate air and gas pumps, during two strokes or one revolution of the fly wheel (Korting cycle). The respective merits and the adaptation to various uses of two-cycle versus four-cycle engines can be briefly summarized as follows: Double-acting two-cycle engines of the improved Korting type are superior to the tandem combination of four cycle engines (which continues to be the standard construction), for certain services such as blowing, compressing, pumping and direct roll drive, on account of their greater capability of maneuvering, and of their greater reliability in operation. These advantages are mainly due to the employment of separate pumps for scavenging and charging. Gas and air being pressed into the cylinder in regulable quantities according to the load, securing a more perfect mixture according to the high rate of diffusion of the gaseous molecules, the power cylinder is practically independent of pressure variations of the two constituents in their respective admission pipes. Hence speed regulation from the maximum to the lower limit—which is naturally fixed by the weight of flywheel—can be executed with absolute certainty. Further, double acting two-cycle engines will start quicker even than steam engines (considering the steam raising in boilers and the gradual heating up of the engine, and with a heavy load on, requiring only low air pressures in the receiver. Their total length also is considerably shorter than that of the tandem combination, which is of importance when driving blowing engines, and especially when competing with turbine blowers. Their greater reliability in operation is chiefly due to the absence of exhaust valves, the discharge slots used, when cut in a separate cylinder liner, being an absolutely safe and enduring organism. Lubrication, which in modern practice is effected through the piston, can be made more effective with long pistons than with short ones.

Against these and other advantages stands the drawback that the work expended in two-cycle engines for charging is a greater amount than the corresponding item in four-cycle work, amounting as it does, even in the latest two-cycle constructions to from 5

to 7 per cent of the total indicated output. Moreover, and this is the main reason which precludes the employment of double acting two-cycle engines for driving large electric alternators, their speed cannot be increased beyond a certain maximum, which remains considerably below that of four-cycle tandem engines. Thus a Korting engine of 1,000 horsepower cannot very well run faster than 85 revolutions per minute, while a tandem combination of the same size runs normally at from 107 to 110 revolutions. Hence there is with the last named type a saving in cost of generator and weight of revolving masses. This speed limitation of two-cycle engines is due less to the increased charging work at higher revolutions than to the reduction of time available for the opening and closing of the inlet valves which must be performed during a crank angle of 90 degrees and less.

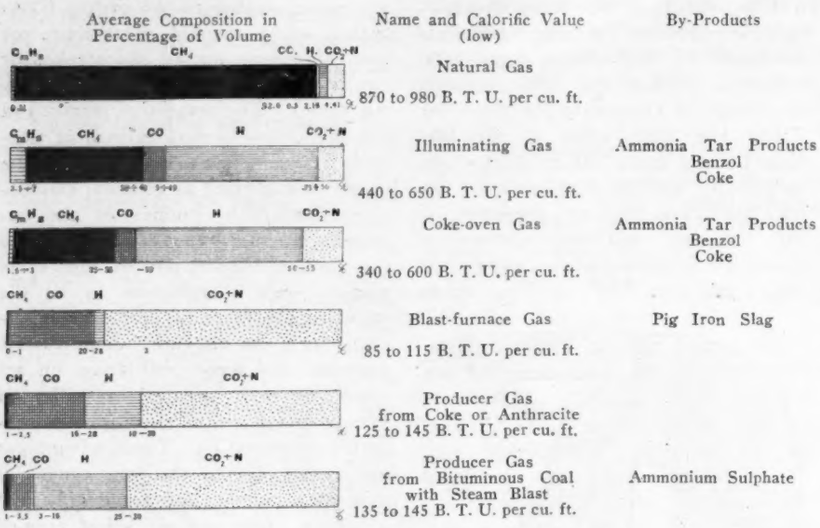

Average Composition in Percentage of Volume
Name and Calorific Value (low)
By-Products
Natural Gas
870 to 980 B. T. U. per cu. ft.
Illuminating Gas
Ammonia Tar Products Benzol Coke
440 to 650 B. T. U. per cu. ft.
Coke-oven Gas
Ammonia Tar Products Benzol Coke
340 to 600 B. T. U. per cu. ft.
Blast-furnace Gas
Pig Iron Slag
85 to 115 B. T. U. per cu. ft.
Producer Gas from Coke or Anthracite
125 to 145 B. T. U. per cu. ft.
Producer Gas from Bituminous Coal with Steam Blast
Ammonium Sulphate
135 to 145 B. T. U. per cu. ft.

FIG. 2—CHARACTERISTICS OF FUEL GAS.

Also, the accuracy of governing is usually greater in four-cycle engines since, in the two-cycle type, the quantity of gas enclosed between pump and inlet valve escapes regulation, so that the governing effect is somewhat retarded. There is a tendency, though, among builders of Korting engines to shift the gas regulating mechanism away from the pump and as close as possible to the inlet valve, so that the last named objection would be minimized and perhaps eliminated altogether. Finally there is this drawback about double-acting two-cycle engines as built at present, that the capacity of single units is practically limited to 1,200 horsepower in one cylinder. Beyond this capacity the double-acting, four-cycle tandem engine will be given preference. For builders of steam engines, contemplating the manufacture of large gas engines, and for all intending purchasers of modern prime movers it is very important to keep the above outlined merits and demerits of two-cycle versus four-cycle in mind, when making their selection.

Systems of Governing and Regulation.

For large gas engines working in iron and steel smelting plants and collieries the attainment of greatest simplicity of design and reliability of service is a demand outweighing that for maximum fuel economy. Elaborate methods of governing are often useless for the simple reason, that the engines hardly ever operate below three-quarter load, assuming that auxiliary motors all over the works are operated from a gas-engine-driven central station. Conditions are different when rolling mills are attached to the central plant. Their average power demand is only one-third or one-half of the maximum required at certain periods. Hence the plant load curve assumes a rather fluctuating course, and it becomes necessary to provide for efficient regulation at low loads, else the margin of superiority of gas-driven generators over turbo-generators is less pronounced. In some such cases it has been found that the actual saving in fuel was only 50 per cent over gas-fired boilers and steam-turbine-driven generators, when the load curve was fluctuating as above stated. The question of course, arises whether the gas which is saved through refinements of regulation during periods of low loads can be used otherwise, whether it can be stored in holders, or compressed and transmitted, or whether any surplus electric energy generated in the central station can be distributed outside the works. So the system of regulation adopted will have to depend first of all on the kind of service

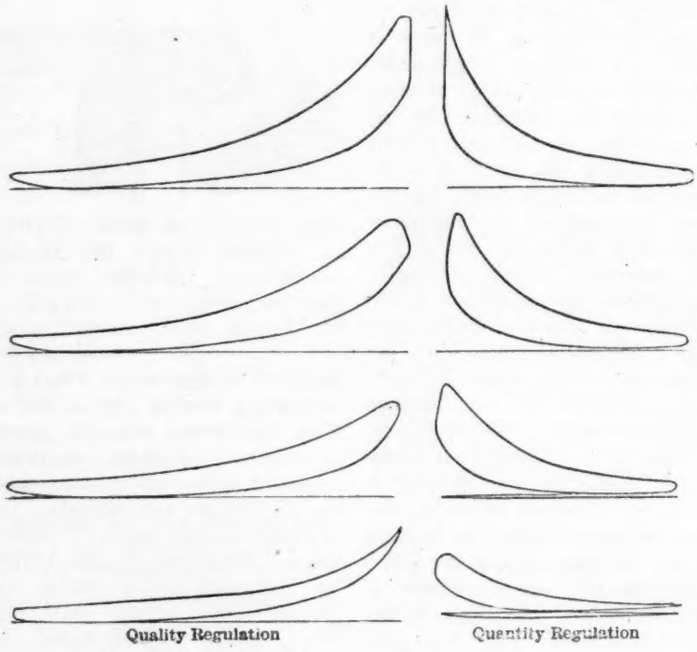


FIG. 3—DIAGRAMS SHOWING RELATIVE COMBUSTION EFFICIENCIES OF QUANTITY AND QUALITY REGULATION AT VARIOUS LOADS.

which the engine is expected to perform.

Taking up the standard two-cycle engine, Korting type, it is known that they must invariably work with constant compression, adjusting the calorific capacity—that is the thermal value per unit of the three constituents, air, gas and burnt residuals. The employment, in two-cycle engines, of separate pumps introduces this advantage that at high loads perfect expulsion of the burnt gases is obtainable by scavenging. Thus the combustion efficiency of the new charge is not impaired by the products of the former combustion which, in four-cycle engines, form a nearly constant factor, diluting the mixture in a cumulative ratio at decreasing load. The retarding effect of an arrangement, which controls the gas admission to the cylinder at a distance from the inlet valve, on the promptness of the governing effect was mentioned above.

In standard four-cycle engines we may distinguish between three principal modes of governing. 1. Quality regulation, characterized by the following features: The quantity of the combustible charge remains constant under all conditions of load, while its quality is changed by varying the gas supply. This method obviously regulates the power of the engine by regulating the calorific value of the mixture and thereby the initial pressure due to combustion. 2. Quantity regulation, the richness of the mixture, that is, the proportion of gas to air remains (theoretically) unchanged, while the quantity of charge admitted to the cylinder is automatically varied by the governor, according to the power required at the moment. This is done either by throttling throughout the whole length of the stroke, or by cutting off the supply at some point corresponding to the demand. The latter arrangement is superior in reducing the negative suction work, but it requires a special device for regulating the mixing valve, similar to what is done in quality governing.

The relative combustion efficiencies resulting from quality and quantity governing at various loads can be studied from the accompanying diagram Fig. 3. Both systems have their advantages and their drawbacks. Highest efficiency is attained by combining the good features of both modes of regulation and eliminating their weak points. One solution of such a combination system is that employed by Mees, in Germany. Engines equipped with the Mees system work from normal up to maximum load with a qualitative, and from normal down to no load with quantitative regulation. Thus maximum efficiency is attained under normal conditions, the engine taking in a full charge of gas and air, mixed in proper proportions. With increasing load the quantity of gas admitted is increased, but the efficiency remains almost constant up to maximum capacity, where it is more or less reduced, according to the degree of overload, similar to steam engine practice. From normal load down the quantity of the charge admitted is diminished, its quality remaining the same. Compression, therefore, decreases also, but is always kept higher than the corresponding compression of an engine working with pure quantitative regulation, as with the latter throttling begins at a load immediately below the maximum.

In order to secure a reasonable degree of overload capacity without knocking of the gear, the point of ignition should be automatically retarded in the measure as the heat density of the charge increases, provided this can be done without unduly complicating the mechanism of the engine. Summarizing, we are led to the following ranking of the systems of governing in order of merit. 1. Combination system, for close regulation and economy (electric lighting service). 2. Quantity governing, for various services. 3. Quality governing, for crude regulation regardless of gas economy (blowing, pumping, etc.).

As to the effect of the governor on the regulating process and vice versa it is evident that the closeness of regulation of a heat engine will be the greater the quicker the governor will adapt itself to sudden fluctuations of load, and the smaller the continuous difference of the number of revolutions per minute between full load and no load. The action of the governor will therefore be the prompter, the less frictional resistance there is to be overcome in the controlled mechanism and gear, or the less back pressure is acting upon it. This means also that the greater the reactionary forces of the moving parts, the more powerful must be the governor to counteract them properly. In double-acting, twin-tandem engines there is a considerable back pressure exercised on the governor. Hence, it is obvious that dust and tar and other impurities contained in the gas are very undesirable not only because of clogging up the cylinder and causing premature ignitions, but because they have a retarding effect on regulation. When they accumulate in the valve system in excessive quantities regulation will be made entirely impossible. It is therefore bad practice to combine the main inlet valve and the regulating gas valve in concentric fashion, the greater simplicity of appearance of such an arrangement being offset by the liability to breakdown which it entails.

Generally speaking, the coefficient of regulation should remain at fluctuations from full to no load between 3

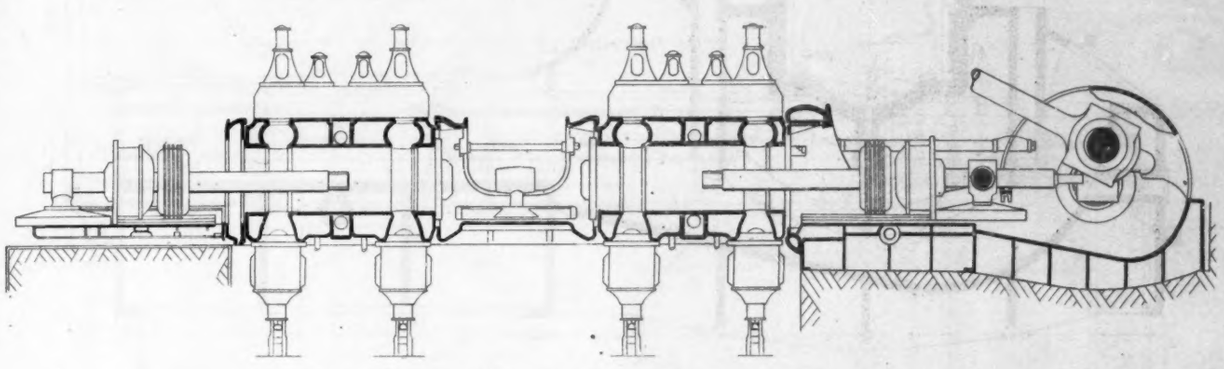


FIG. 4—NURNBERG ENGINE, SHOWING ACCESSIBILITY OF PARTS.

and 4 per cent. Sudden load fluctuations of 25 per cent should not provoke a momentary variation in the number of revolutions greater than 1½ per cent. Of course, the scope of these requirements depends entirely on the class of service for which the engine is intended. As to the effect of the system of regulation on the weight of flywheel, it is evident that modern engines working with admission on each cycle enable us to use fly wheels relatively less heavy than was possible with the traditional hit and miss type. The weight of flywheel depends also on the class of service which the engine is required to perform. When driving electric generators the rotating masses of the dynamo are usually designed so heavy as to render sufficient kinetic energy for securing a steady turning moment, so that the flywheel proper can be dispensed with For ordinary industrial purposes a cyclic regularity of 1-25 to 1-30 is sufficient. For lighting service with direct-current generators the degree of irregularity should be less than 1-50 or 1-60; while for driving alternators in parallel it should be as low as 1-125 and preferably less.

General Arrangement and Accessibility of Parts.

We cannot here go into a detailed discussion of the reasons which have led to the abandoning of the old time single-acting and multiple cylinder systems. Suffice it to say that the tandem arrangement of cylinders, and for very large powers the twin-tan-

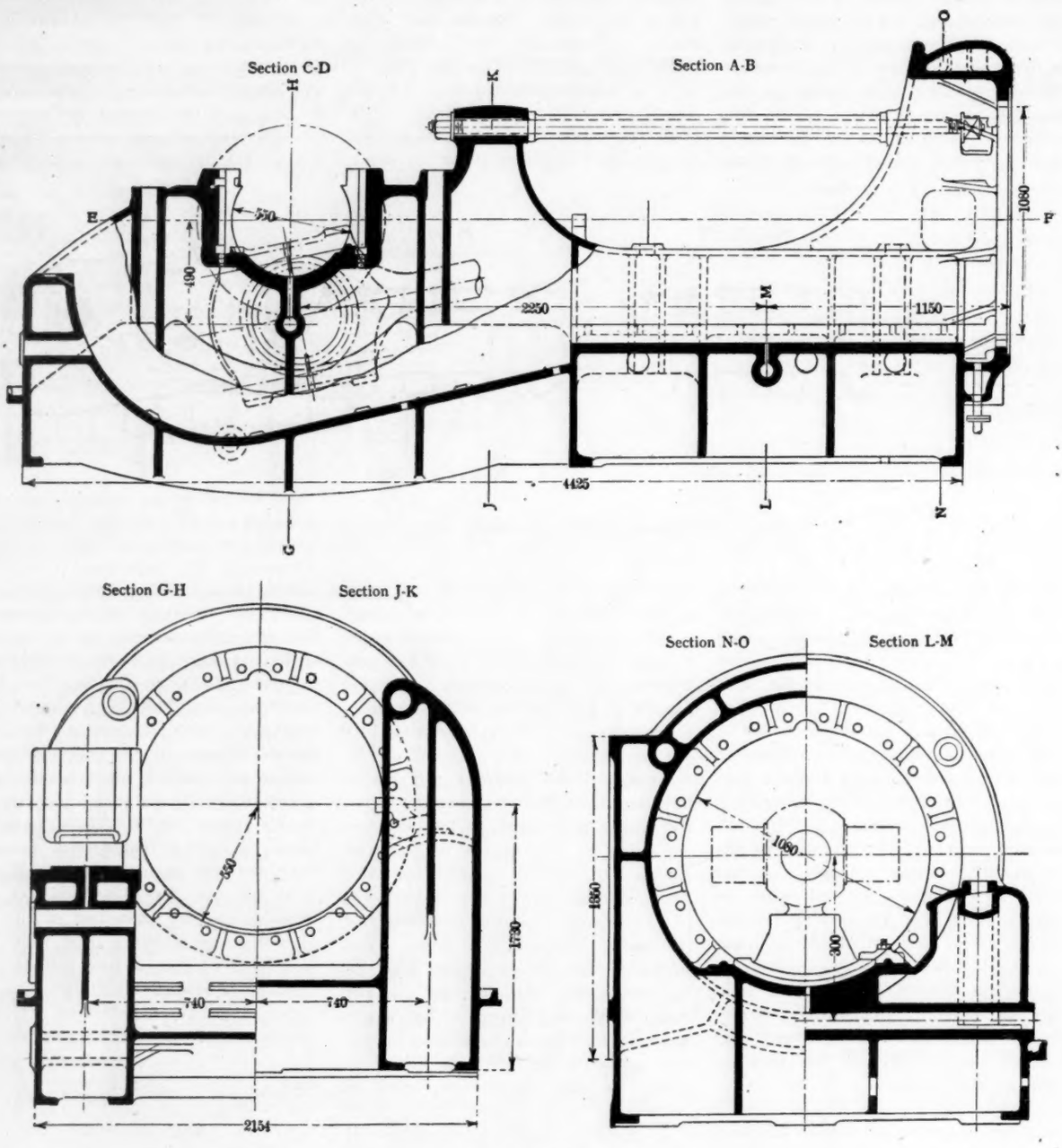


FIG. 5—FRAME OF NURNBERG ENGINE.

dem arrangement has been found the most satisfactory solution from the mechanical point of view. Capacities of 1,000 horsepower and more in one cylinder are practiced today, and with proper design there is no other limit drawn to a further increase in output but through workshop equipment and railroad transportation facilities.

With engines ranging up to 4,000 and 5,000 horsepower units a most important problem consisted in finding a suitable arrangement of parts, which would allow the quick and easy dismantling of the heaviest pieces; cylinder heads and pistons, in order to get by simply unfastening and sliding the cylinder heads, on the supporting piston rod, out of the way. Thus access can be had to inlet, exhaust valves and piston rings without having to take off the valve cage, or remove the cross head from its guides, or disconnect the valve gear. When the piston is to be withdrawn the connection between the cross head and the piston rod is released, and the piston is drawn out through the front or rear cylinder aperture, preferably the latter on account of avoiding the necessity to dismount the connecting rod. Or the connection between the piston and the rod may be released from tie rods at a considerable distance above the horizontal center plane. The main pressure transmitted through the connecting rod being directed toward the guide below, there are only two ledges provided in this design to keep the cross head in a true path. See Fig. 5.

In other types and almost universally in the larger sizes where the side walls of the frame are so high that it is impossible to get access to the moving parts from above, the top is closed by a solid wall cast with the frame and serving to transmit all forces applied in front at the main bearings to the circular back flange.

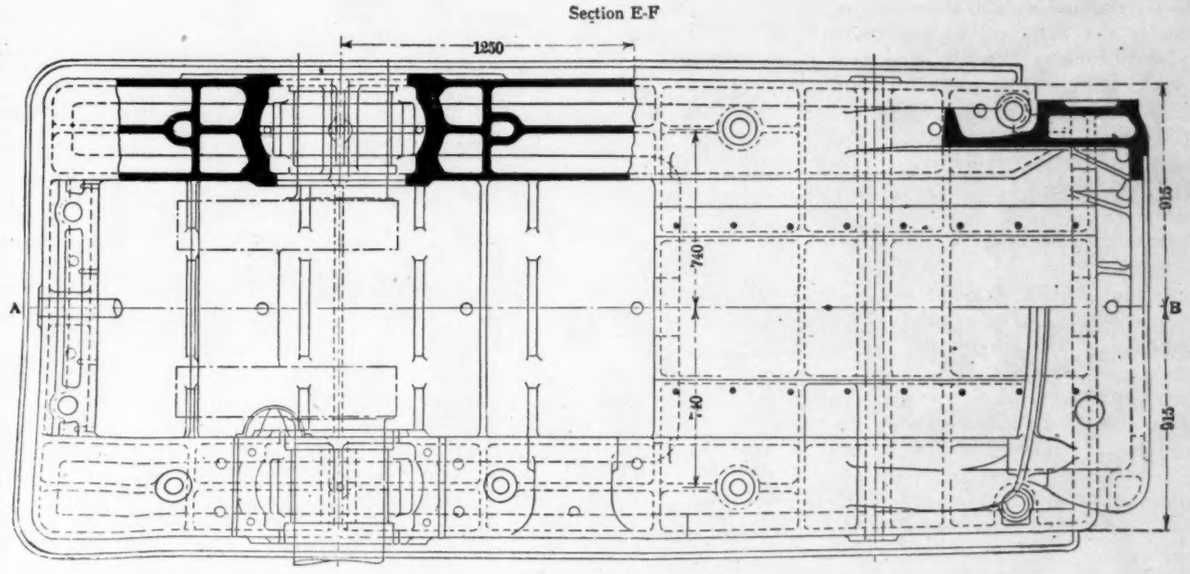


FIG. 5A—PLAN OF FRAME OF NURNBERG ENGINE.

access to piston rings and exhaust valves, the latter being still the most vulnerable organism of large gas engines, requiring frequent cleaning, even when well designed and properly cooled. Fig. 4 shows the solution invented by the Nurnberg engineers, who deserve the credit of having done the pioneer work in this line of machine building. The arrangement is particularly noteworthy for the fact that only few parts have to be unfastened or taken down, and the use of a crane is not necessary.

The pistons are supported by the piston rod which, in turn, rests on two, or in tandem engines, on three cross heads, front, center and back, which are supported by guide beds, the plane of which lies below the bottom of the cylinder, so as not to obstruct the removal of pistons. The interior of the cylinders is inspected without and the piston, resting on the slideway, drawn out without dissolving the connection between the cross head and the piston rod.

After this general survey we shall now proceed to study the principal parts of large gas engines in detail.

Frame.

The crank case is formed between the two main bearing supports and serves as a receptacle for the lubricant. A circular guide bed for the cross head and a flange to which is bolted the front end of the first cylinder of the (tandem) combination completes the equipment. Accessibility to the crosshead is secured in some types by cutting down the upper edges of the side walls, while strength and fairly central distribution of forces are attained by connecting the cylinder flange and the main bearings by heavy Accessibility is here secured by making two large openings in the side walls of the frame. Thus the whole casing can be machined by the boring bar at one setting and requires no other treatment. The circular guide bed and the face of the flange must therefore be absolutely true.

The frame rests on the foundation along its entire length, being held down by anchor bolts, while the distance piece and tail end of the (tandem) combination and their accessories are supported by base plates. They are fastened thereto so as to allow free expansion parallel to the center line of the engine, the variations in length being due to the influx and efflux of heat. Altogether the actual expansion is very slight, since efficient and regular cooling of cylinders, pistons and rods keeps down the average internal tempera-

tures below that of modern steam engines working with superheat.

This is a remarkable performance considering the difficulties under which gas engines have to work, as compared to steam engines. With steam engines, a temperature of the superheated steam of 350 degrees Cent. seems to be the economic maximum, while in gas engines as high as 2,000 degrees Cent. are momentarily recorded. In view of the fact that 500 degrees Cent. represents the limit of resistance of all materials that can be employed for building these engines it will be evident that efficient cooling is a requisite of first importance for this class of work. In a comparison on hand the difference in longitudinal expansion and contraction, owing to the extremes of heat flow, of a steam engine 65.6 feet long was 0.6 inch, and of the piston rod 0.7 inch. The corresponding figures of a gas engine of equal length are 0.08 and 0.1 inch respectively.

If in order to reduce first cost, facilitate erection and make the product more salable to traditional Corliss engine customers, the central crank is dispensed with and the side crank adopted, then one bearing has obviously to do not only the service of two bearings, but more. Owing to the greater load the weight and dimension of the single bearing become much larger, and owing to the greater frictional surface needed the friction work becomes about three times higher than what it is in the central frame. Also the difficulty of properly lubricating and cooling the bearing is proportionately increased. The same holds true of the crank, which becomes extremely heavy. From the standpoint of mechanical excellence and durability in service the second bearing is certainly a good investment, as has been proven in Germany

[Editor's Note.—The second and concluding portion of Mr. Junge's article deals with the design and construction of the remaining portions of the gas engine, including pistons, cylinders, cranks, valve gear, etc. It will be published in THE IRON TRADE REVIEW of April 16, 1907.]

The blast furnaces of the Tennessee Coal, Iron & Railroad Co., at Ensley, Ala., made a new high record, March 14, of 1,365 tons of iron. This showing, which is the largest output in the history of the plant, was made by four stacks, the last record being made in May, when 1,355 tons were made by five stacks.

PRESENT WESTINGHOUSE-PARSONS STEAM TURBINE DEVELOPMENT.

That the steam turbine is not losing ground in its rapid introduction into all classes of power service, is evidenced by the following table showing the aggregate turbine business of the Westinghouse Machine Co., at the beginning of the year, classified according to industries. This table shows a summary of 640,700 kilowatts, or 930,000 brake horsepower. This output is distributed among 282 plants (an average of 3,298 brake horsepower per plant) and 493 machines, averaging 1,886 brake horsepower per machine.

SUMMARY OF WESTINGHOUSE TURBINE DEVELOPMENT, INCLUDING ALL PLANTS SHIPPED OR ON ORDER UP TO DEC. 31, 1907.

Classification—	Plant Capacity— up to 1,000 K. W.	Plant Capacity— above 10,000 K. W.	Total number of plants.	Aver. capacity of turbines, kilowatts.	Total capacity, kilowatts.
Electric Traction—					
Electric railways	18,900	144,500	69	1,975	282,600
*(R. R. electrification)	.....	33,900	4	3,350	46,900
Total	18,900	178,400	73	.....	329,500
Electric Lighting—					
Central stations	23,550	45,000	73	1,440	180,100
Isolated plants	3,200	.....	7	400	3,200
Municipal	4,000	.....	11	570	8,700
Total	31,700	45,000	91	.....	192,000
Steam Railroads—					
R. R. electrification	.....	33,900	4	3,350	46,900
*(R. R. car shops)	9,200	.....	17	490	15,700
Total	9,200	33,900	21	.....	62,600
Industrial—					
Textile mills	8,200	.....	22	595	13,700
R. R. car shops	9,200	.....	17	490	15,700
Cement mills	700	.....	5	1,012	7,100
Iron and steel works	1,000	.....	3	500	5,000
Pulp and paper mills	800	.....	5	778	7,000
Rubber works	900	.....	4	621	4,350
Powder works	1,200	.....	2	400	1,200
Machinery manufacturers	5,400	.....	12	576	15,000
General manufacturers	5,750	.....	11	453	7,250
Total	33,150	.....	81	.....	76,300
Mining and irrigation	8,000	.....	19	686	21,950
U. S. Government	1,750	.....	4	1,225	12,250
Miscellaneous	6,700	.....	14	483	8,700
Grand total	99,250	223,400	282	.....	640,700

*Industries in parentheses, but allowed for in grand total.

Note.—Business uncompleted Dec. 31, 1907: 60 turbines of 153,550 kilowatts total, leaving shipped or in operation 433 machines, or 487,150 kilowatts, averaging 1,122 kilowatts.

But in addition to this output listed above, there were at that time under construction at East Pittsburg 148 machines. These bring the grand total of the turbine business of this company up to the large figure of 864,300 kilowatts, or 1,253,000 brake horsepower, so that the one and a quarter million horsepower mark has been passed in the operations of the Westinghouse companies alone.

Referring to the table, attention is particularly called to the rapid advancement in steam railroading, textile mills and mining. Although there are comparatively few railroad electrification plants yet installed, their capacity is large—11,670 kilowatts per plant. In paper and textiles there are 27 plants, aggregating 20,700 kilowatts, an average of 767 kilowatts per plant. Nineteen mining properties have adopted turbo-electric drive. Thus, while the most fruitful field for the turbine in the early days of its development was in electric traction and electric lighting work, its field has greatly broadened out into the general industries until today nearly 15 per cent of the total represents manufactures as against 34 per cent electric lighting and 51 per cent in traction. That this result has been achieved with practically one type of turbine is a creditable reflection upon its fundamental design. An idea of the size to which modern central stations have grown is furnished by the fact that nearly 35 per cent of the total capacity tested is contained in stations of over 10,000 kilowatts capacity. A decade ago, at the beginning of the turbine business, stations of this size were few and far between. Today most large cities can boast of at least one, if not several, stations of this capacity.

In this connection, some data on the development of the Parsons type turbine for marine work in Europe, are of particular interest. Sir William Matthews, in his recent presidential address before the British Institute of Civil Engineers, cited the following facts:

"In the middle of the present year (1907), there were in service 61 steamships fitted with Parsons turbines, and 65 vessels under construction to be furnished with them. The total horsepower of these ships approached 1,400,000 Of this, about 42 per cent was in merchant vessels and yachts, and 58 per cent in warships.

SOUTH AMERICAN GAS PRODUCER POWER PLANTS

Several years ago there were established at Buenos Ayres, two high-grade producer gas power plants using imported bituminous slack coal, and each serving an extensive aggregation of passenger, freight and car shop buildings for the terminals of the Great Western and the Great Southern railways, respectively. The larger of these, at Banfield, serves the former; the smaller at Liniers, the latter. Both plants are equipped with Westinghouse gas-engine-driven alternators for electric distribution, and Mond bituminous producers without by-product recovery. Some of the engines were furnished from the Westinghouse Machine Co., at East Pittsburg, and some by the British Westinghouse Electric & Mfg. Co., Ltd.

The service from the two plants is quite similar, and as the equipments are almost identical, a general description of the system will suffice for present purposes. The accompanying illustrations, Figs. 1, 2 and 3, are typical, and are of much interest particularly from the fact that these two plants are the first gas power installations in South America. Both have been highly successful and offset to a considerable extent, the discouraging reports from Johannesburg, South Africa—success in the present instance resulting from the adoption of a well-known and tried-out design, and failure in the latter from a city government injudiciously accepting literally the lowest bid.

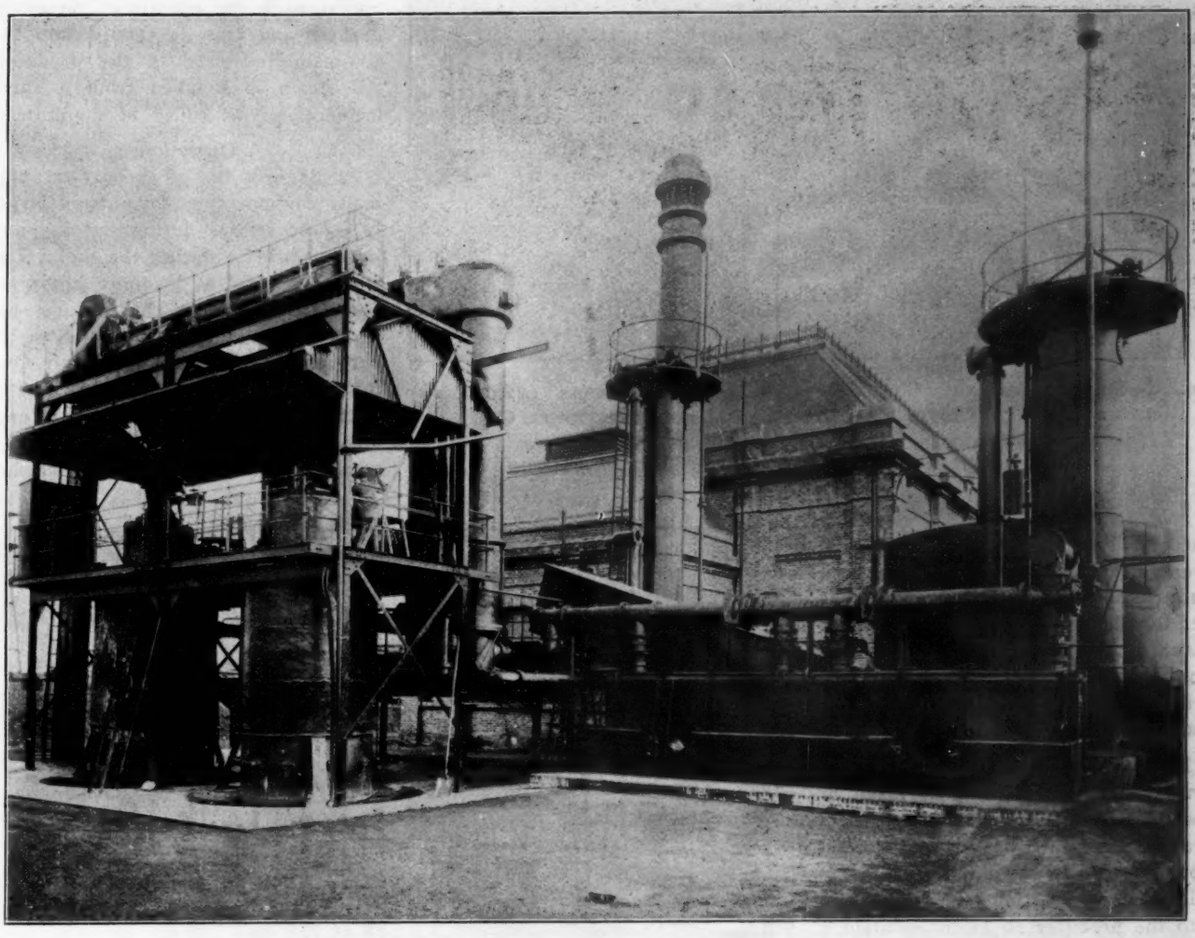


FIG. 1—PRODUCERS AT THE LINIERS PLANT.

These two installations aggregate 2,375 brake horsepower, 1,500 brake horsepower at Banfield in six units, and 875 brake horsepower at Liniers in four units. Most of the engines are of the 19 x 22-inch, three-cylinder, vertical type direct connected to 150-kilowatt standard Westinghouse three-phase, 50-cycle alternators, spring coupled and with continuous bed plates. See Fig. 2. All of these engines operate in parallel on the shop load. At Banfield, electrical distribution is carried out at 6,600 volts through an underground conduit to sub-stations and other centers of consumption, while at Liniers the 440-volt, 3-phase system was adopted. The shops and terminals are completely electrified with induction motors, and individual drive is largely used for such purposes as cranes, capstans, elevators, blowers, pumps, air compressors, etc. Group driving is employed only in the case of small tools. At the Liniers works, there are installed 93 motors ranging from ¼ to 80

horsepower, aggregating 1071.5 electrical horsepower, practically equal to the generating capacity.

The most interesting feature of the producer plant is that it is operated successfully on bituminous slack coal, averaging 12,250 B. T. U. per pound, and costing from $5.60 to $6.70 per net ton delivered. The equipment was manufactured by the Gas Power Corporation of London, and is the standard Mond system without by-product recovery.

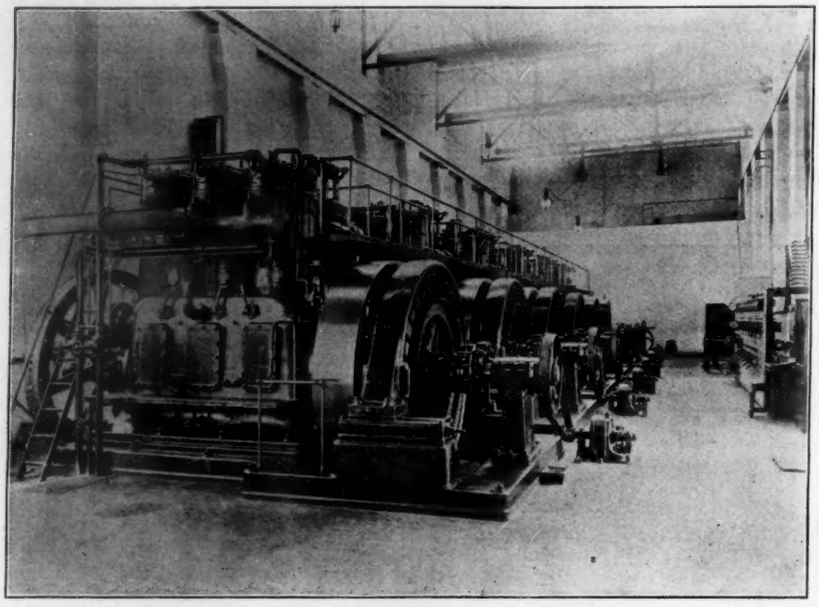


FIG. 2—SIX 150-KILOWATT, THREE-PHASE, 440-VOLT GENERATORS DIRECT-CONNECTED TO WESTINGHOUSE THREE-CRANK 250-BRAKE-HORSEPOWER GAS ENGINES. BANFIELD POWER HOUSE, BUENOS AYRES GREAT SOUTHERN RAILWAY.

Briefly, the arrangement is as follows: Referring to Fig. 1, taken at the Liniers plant: The producers are of the water-sealed type and double-walled with internal fuel distributing cone extending well down into the producer so as to maintain a constant level. Blast is supplied by a steam-driven Roots blower, and before reaching the producer, passes through a series of economizing operations designed to return the latent heat of the gases to the fuel bed in the form of hot blast. 1. The blast is heated and saturated in its ascent through an air heating tower, which is in turn supplied with hot water from gas cooling tower (both towers shown in Fig. 1). 2. The hot saturated air blast is then conveyed to vertical superheaters stationed at the outlet to each producer and shown at the rear. These are simply double, concentric pipes in which the hot gas descending, delivers its sensible heat to the ascending air. Finally, the hot vapor-laden air blast passes down the outer wall, or air jacket, of the producer shell and enters the fuel bed at the bottom through a conical tuyere.

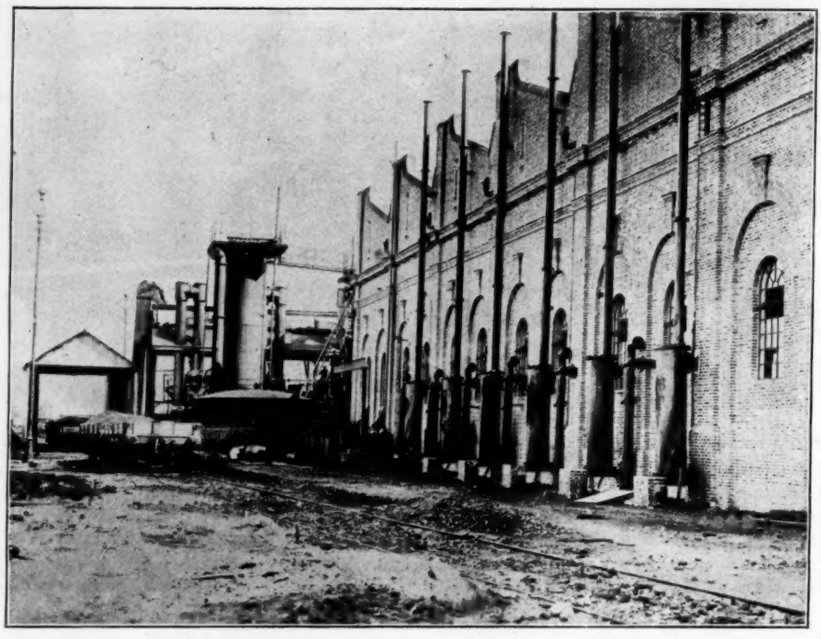


FIG. 3—REAR VIEW OF PRODUCER PLANT, SHOWING GAS HOLDER AND HEATING TOWER.

Gas is drawn off above the fuel bed, and after traversing the superheaters, is partly cleansed and cooled in a rotary washer of the splash type. This is shown in a long rectangular box in the foreground, fitted with two rotary splashers. It is further cooled in ascending through a gas cooling tower filled with earthenware checker brick, wet down with a spray of water from the air-heating tower. This water is thus alternately cooled and heated and simply serves to transfer heat from the gas to the air, thus returning fuel to the fire-bed. Finally the gas is piped to a gas holder, thence to centrifugal dust and tar extractors, and lastly through sawdust scrubbers. Steam used for operating conveyors, dashers and fans, is carried into the air main and used in the producer. All steam is supplied from a small locomotive-type boiler in duplicate.

Operation.

At Banfield the plant operates normally 24 hours per day, giving largely power service during the day and lighting service during the night. The former yields a loading factor of about 50 per cent, but during the night the loading is light—about 10 per cent of the plant capacity. Owing to the occasional abnormal fluctuations in load, an idle engine is usually kept running during one shift, which tends to decrease somewhat the plant economy. Eight-hour shifts are maintained. While the engine room staff is normal, the gas plant requires considerably more labor than usual owing to the short shifts and poor coal. As a matter of fact, con-

siderably greater producer plant capacity could be operated by the same staff, including the necessary attention to tar and auxiliaries.

AVERAGE OPERATING COSTS—1,500 H. P. WESTINGHOUSE MOND PRODUCER PLANT.

BUENOS AYRES GREAT SOUTHERN RAILWAY, BANFIELD.

	Day.	Night.	Average.	Percentage of total.
Coal—10,000 B. T. U. slack, at $5.60 per ton	0.52	0.88	0.76	44.4
Wages—				
Engine room	0.16	0.53	0.32	18.7
Producer room	0.32	0.45	0.38	22 2
Supplies and stores	0.10	0.20	0.13	7.6
Running repairs	0.12	....	0.12	7.1
Total cost per kilowatt-hour	1.22	2.06	1.71	

These costs represent an average over six months operation for the loading factors above named. During this period, the average consumption of bituminous slack at the plant, including standby and all losses from the ship's hold to the producer, was about 3 pounds per kilowatt-hour, or for the day load, about 2 pounds per kilowatt-hour. Even at the prevailing high price, the coal is of very poor quality, not much exceeding 10,000 B. T. U. per pound. This is partly due to the fact that owing to the number of times the coal has to be handled, it becomes powdered to such an extent that screening is impossible on account of the great waste. As the fine coal sometimes runs as high as 40 per cent of the total, this increases the difficulty of handling in the producer, also necessitating at the same time, more producer labor than would be necessary with a more suitable coal.

Executive Reorganization.—The Republic Iron & Steel Co. has reorganized its executive heads for the Mahoning valley plants. J. W. Deetrick, general superintendent for the valley district, becomes general superintendent of the blast furnace department both north and south bes de retaining supervision of the Brown-Bonnell and the Bessemer plants. T. R. Akin is named general superintendent of the company's rolling mills; Mahoning valley, Corns, Toledo, Inland, Sylvan and Indiana plants in the north, and the Gates City and Birmingham plants in the south. Both will report direct to Vice President T. J. Bray in Pittsburg. Frank Brown, chief clerk at Pittsburg offices, will have charge of the clerical forces of the operating department in the Pittsburg district.

The capital stock of the John Deere Plow Co., Kansas City, Mo., has been increased from $200,000 to $800,000.

"BLISS" PRESS OPERATING TWO DIES SIMULTANEOUSLY.

To accomplish rapidity of manufacture and the consequent reduction in the cost of production wherever possible, operations in the manufacture of sheet metal goods are combined. With this idea in view, the E. W. Bliss Co., 8 Adams street, Brooklyn, N. Y, has recently added another machine to the large number of labor saving machines, which it has recently built, which is shown in the accompanying illustration. This press was built for producing at each stroke a blank which requires two operations, one of which is the beading of wire around the rim.

BLISS "TWO DIE" PRESS.

The operation of the press is simple; in fact, its simplicity is an important factor. The first die A, a regular combination die, cuts, draws and forms the blank. The press being in an inclined position the formed blank then falls by gravity down a chute and stops at the finger gage B, which, in conjunction with the chute, holds the blank in position until the next revolution of the press at which time the wiring is done in wiring die C. At the same time, another blank is also being cut and formed in the combination die. On the next stroke the wired blank is released by the operation of the finger feed at the back of press, and falls into a receptacle placed to receive the finished blanks. The finger feed returning quickly centers the next blank to be wired, repeating the operation at each stroke of press. The feed is operated by a cam D on end of the crank shaft. The crank shaft has a stroke of 2 inches and is made from hammered high carbon steel. The mandrel is fitted with a cross bar knockout. The flywheel weighs 950 pounds and makes 125 revolutions per minute. The press as shown weighs 5,350 pounds.

Bradstreet's gives the total building expenditures in February at 74 cities of the United States as $24,924,104, as against $22,104,083 in January, and $41,612,495 in February, 1907.

REINFORCED CONCRETE CONSTRUCTION FOR THE FOUNDRY

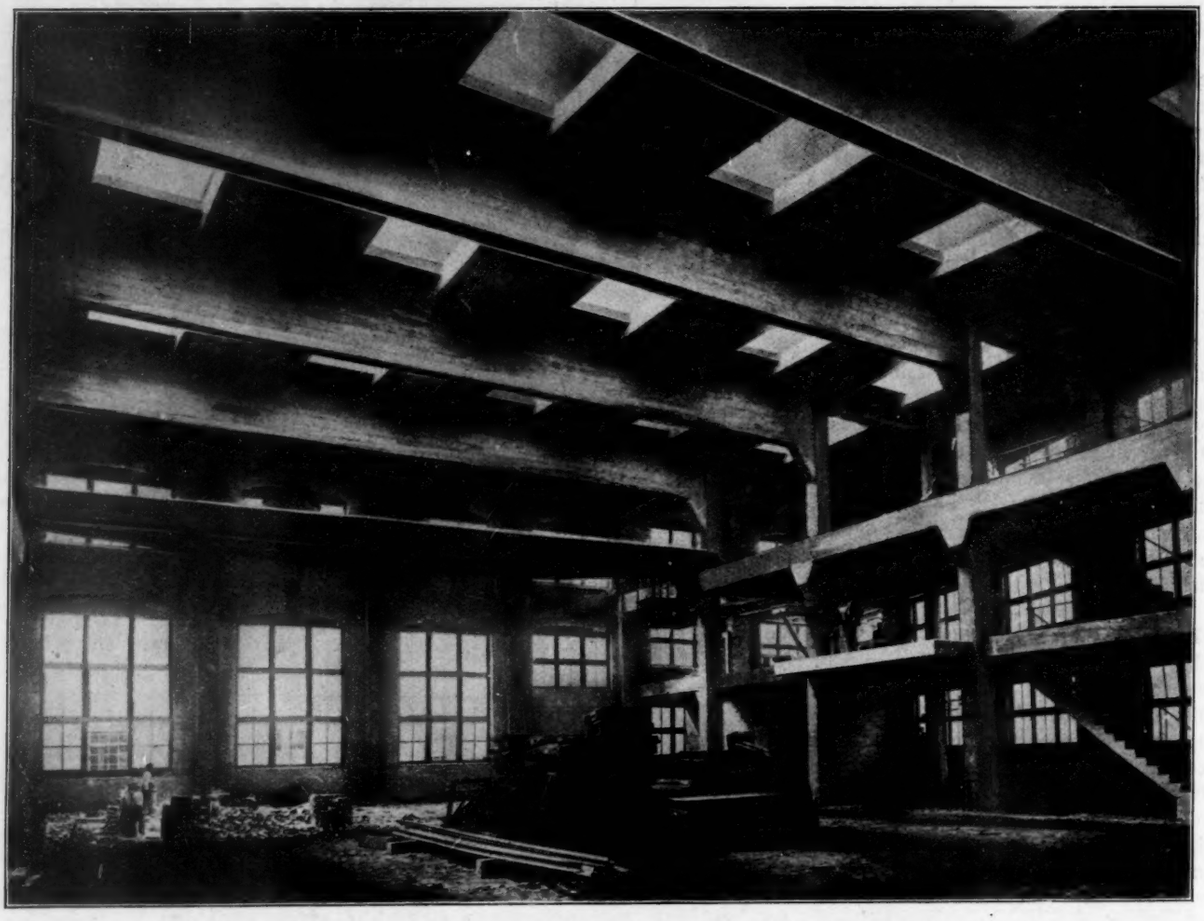
A Building with Long Span Roof Girders for Williams, White & Co., Moline, Ill.

An interesting example of reinforced concrete construction has recently been completed by the Trussed Concrete Steel Co., Detroit, for Williams, White & Co., Moline, Ill. The building is designed for use as a foundry, although up to the present time it has not been used except for the storage of castings. It occupies an irregular area 133 feet 3 inches by 120 feet 6 inches in extreme dimensions. The building is so designed that practically the entire enclosed space is unobstructed by internal columns. But seven columns in all are used in the building, these being arranged along the longest side and quite close to one wall, as shown in the illustration. The roof is flat and composed of a 4-inch slab of concrete, 40 per cent of the area being replaced with skylights, each of which is 7 x 18 feet.

The building was constructed on the Kahn system and is especially interesting on account of the long span of the main girders, and also on account of the fact that it was impossible to make these girders continuous. This fact rendered it necessary that the diagonal or shear members of the reinforcing should be rigidly attached to the main horizontal reinforcement. In this particular case one of the special features of the Kahn system was utilized; rigid attachment was secured by riveting angles and flats to obtain the desired reinforcement.

There are five of these girders, each with a clear span of 74 feet 8 inches. Between the girders, which are placed approximately 20 feet centers, extend 10 x 16-inch beams placed along either side of all the skylights. The main roof girders are 78 inches deep, including the 4-inch roof slab, and 16 and 28 inches wide at the bottom and top respectively, the increased width in the upper part being necessary to provide ample compression area. The unobstructed space is 78 x 123 feet.

The crane shown in the illustration was supplied by Niles-Bement-Pond Co. and has a clear span of 73 feet



INTERIOR OF CONCRETE FOUNDRY BUILDING OF WILLIAMS, WHITE & CO., MOLINE, ILL.

center to center of rails and a capacity of 15 tons. The rails are carried on 18 x 36-inch girders reinforced with Kahn bars. These girders rest on brackets made integral with the columns, as clearly shown in the illustration.

Construction work on the building was begun in 1906 and the building was finished early in the spring of 1907, work being suspended during a portion of the winter. When the forms were removed from the main roof girders, level readings taken on consecutive girders indicated the following deflections:

Girder No. 1.....1/16 inch
Girder No. 2.....3/16 inch
Girder No. 3.....3/16 inch
Girder No. 4.....5/16 inch
Girder No. 5..... 3/8 inch

The maximum deflection was thus 1/2400 of the span. Owing to the breakdown of the concreting machine, about one month's time elapsed between the concreting of girders 1, 2 and 3, and girders 4 and 5. This, taken in connection with the fact that girders 1, 2 and 3 are continuous at one end, explains the variation in the deflections. The building was constructed by the Tri-City Construction Co., Davenport, Iowa, in accordance with the plans prepared by the Trussed Concrete Steel Co.

A BRITISH FORM OF METAL ROOFING.

The accompanying illustrations show a new watertight iron roof covering devised by the British house of Gottschalck & Co., of Manchester and Birmingham, and which is intended as a substitute for slate and corrugated iron roofings. The sheets are made of small area which facilitates packing and transportation, the width ranging from 18 to 36 inches. The metal used may be mild steel or iron of any length required, and the sheets are made with step-like corrugations as shown in Fig. 1, which also shows clearly its method of application to roof rafters. In applying the sheets they are simply laid on the beams or purlins side by side, the upper sheets overlapping the lower ones like slate. At the joints formed by the edges of two sheets, a molded cap pierced at intervals for screws or bolts is laid on the molded sides of the sheets to form vertical side joints. This is shown in Fig. 2. When the screws or bolts have been inserted in the holes the roof is ready for the painter. The length of the lateral lap of the sheets, as well as the arrangement of the molded points permit expansion and contraction, so there is no risk of the roof becoming distorted from changes in temperature. An important feature of a roof formed from these sheets is that the screws,

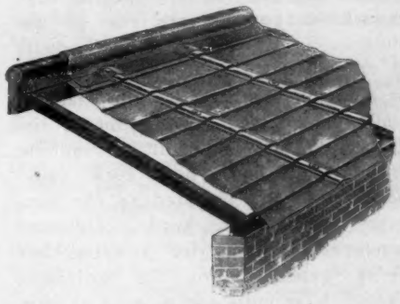


FIG. 1—NEW METAL ROOF COVERING AS APPLIED TO ROOFS.

nails or bolts used for fastening the roof to the purlins do not pass through the sheets, but come between the outer edges into the roof framing. This method permits the use of the sheets on two or three different installations as they suffer no injury by being taken up and put down. Among the advantages claimed for them by

FIG. 2—FORM OF JOINT FOR NEW METAL ROOF COVERING.

the manufacturers is their artistic appearance, their ease of handling and their freedom from injury. They are usually packed in cases of 500 weight each, fitted with screws, etc., ready for attaching to the roof. Galvanized sheets of this type cost about $15 per ton more than ordinary corrugated sheets. It is estimated that one ton of No. 24 gage sheets will cover an area of 1,614 superficial feet.

Manchester Canal Tonnage.—The half-yearly report of the Manchester Ship Canal Co., Manchester, Eng., recently issued, shows that during 1907 the sea borne merchandise amounted to 5,000,000 tons, an increase approximately of 500,000 tons over 1906. The receipts of the year reached $2,500,000, an increase over 1906, of nearly $200,000. The expenditures for the year increased $50,000 and the profit for the year amounted to $1,300,000.

GYPSUM, WHERE FOUND, ITS USE, AND ITS MANUFACTURE.[1]

BY C. O. BARTLETT.[2]

One of the principal objects of the American Mining Congress, as the writer understands, is the granting of a separate department of mining by the government, similar to the department of agriculture, honestly believing that the mining industry is so great and so important that it should have a department by itself.

If this is done by the government it must necessarily include all kinds of mining; not the precious metals alone, but all kinds. For instance, in 1907 there were produced in the state of Vermont very nearly as many dollars worth of granite as the total output of gold in South Dakota. There were over $20,000,000 worth of clay products produced in the state of Ohio last year, nearly three and a half times the value of the gold produced in South Dakota. There was produced in the state of Ohio during the last year more than 27,000,000 tons of coal, and counting its value at $1.50 a ton, this equals more than $40,000,000 worth of coal. There will be received at Cleveland and the nearby ports nearly 40,000,000 tons of iron ore this year. Counting the value at $6 per ton, which is low at the present time, this amounts to more than $240,000,000.

Again, there is another thing very favorable to the cheaper minerals. As soon as the gold is received it is turned over to the government, and the cash is paid for it. But with clay, iron, granite, etc., the work is just begun. The vessels and railroads take the ore and deliver it to the docks. Thence it goes to the furnaces and through the different processes until it comes out different kinds of machinery, each process adding to its value, and also adding very much to the wealth of the country, and very much to the commonwealth of the people, for it requires an army of workmen to do the work required.

I venture the assertion that in the state of Colorado, in the near future the production of coal will exceed the value of the gold. In fact, it is very nearly to that point now. In 1906 there was mined in Colorado about $22,000,000 worth of gold, and over 10,000,000 tons of coal. Counting coal at $2 a ton, it means over $20,000,000 worth of coal mined in the state of Colorado, but a very little less than the total amount of gold. This was in

[1]A paper to be presented before the American Mining Congress.
[2]President C. O. Bartlett & Snow Co., Cleveland.

1906, and it is a question if this year does not bring the coal ahead of the gold. The largest deposits of coal in Colorado have hardly been touched, especially in Route county; not only bituminous coal but anthracite, of which there are large quantities.

There are many other cheap minerals that must, and necessarily should, receive the attention of the government. There is one company in the city of Cleveland, with quarries near that city, that is now shipping more than 85 carloads of its stone product a day, employing an army of workmen. This product goes to nearly every part of the United States. There is another company near Cleveland that is manufacturing a very high grade of pressed brick. It is making about 10,000,000 very high quality pressed brick a year, which are shipped to all the cities from the Mississippi river to the Atlantic ocean, and the present price is about $13 per 1,000.

Another industry belonging to this class is the gypsum industry, on which the writer submits the following:

Gypsum is found in many states in the mountainous localities throughout the United States, and especially in New York, Ohio, Michigan, Iowa, Kansas and several other of the eastern states. It is also found in the eastern part of Canada. The largest deposits are found in Nova Scotia and Newfoundland, and it is of a very high grade. It is generally found near the surface, and is easy to mine. In some places it is nearly pure, and in other places it is necessary to sort it.

At the present time I presume that not one in five have ever heard of gypsum, but nevertheless it is used in every city in the United States in one form or another. It is largely used for making ready-made plaster, and the use along this line is increasing very rapidly. In fact, in 1900 the production was only 429,000 tons. In 1906 it was nearly 1,400,000 tons, and with a very marked increase in 1907. One company is now operating over 30 plants throughout the United States, and is continually behind in its orders. Gypsum is also used for making Portland cement, crayons, and for many other purposes.

Most gypsum is quite hard. It generally contains about 25 per cent moisture. The product manufactured from gypsum rock is generally called calcined plaster of paris. To manufacture this requires the following machinery:

The gypsum rock is first crushed in an ordinary 9 x 15-inch jaw breaker, which easily has a capacity of 5 tons an hour. From this breaker the crushed gypsum rock goes to the second crusher, called a pot crusher, and is again crushed. From the second crusher the material goes to the dryer, where about 10 per cent of the moisture is taken out. The products of combustion should not be allowed to come in contact with the material while being dried, on account of the danger of discoloring it. From the dryer the crushed gypsum rock should be ground, and elevated to the bins over the calcining kettle. Different machines are used for grinding, but as a general thing the horizontal French buhr mills are as good as anything to reduce the rock.

The calcining or boiling is done in a large open kettle, generally 10 feet in diameter and 10 feet deep, with heavy steel sides, and cast iron or very heavy steel bottoms, made convex so as to better resist the heat without sagging. This heavy kettle should have four flues about 12 inches in diameter running through it near the bottom. Inside of the kettle is a heavy shaft supported from above, with heavy sweeps or stirrers below the flues near the bottom, and some mixing paddles above the flues. The shaft must necessarily be very long and supported from above, otherwise the weight of it would tend to break down the bottom of the kettle. The kettle should be set in brickwork, with fire front, doors, grate bars, etc. The heat passes directly under it, and around the sides, and then through the flues and out at the stack. The ground gypsum is fed into the kettle in quantities about 10 tons at a time, and continually stirred and boiled until the remainder of the free water is driven off. It usually takes about two hours to boil one batch. It should be brought to a temperature of 265 degrees Fahr. When properly boiled it will settle, after which it is ready to be discharged, which is done through a discharge gate on the side near the bottom, which is operated by a lever from above.

A large proportion of the calcined plaster is used in this form. If it be desired to make a finer grade it will be necessary to boil it the second time, which in reality is taking out the water of crystallization. If this water of crystallization is once started it must be taken out, otherwise the calcined plaster will be spoiled. A competent and reliable man should always have charge of this calcining kettle, for this is the important part of the business. After boiling it can be either passed over a grading reel and graded, or else the whole product can be ground on buhr mills, after which it is ready for use.

It will also require elevators and conveyors and good heavy bins, which should be made largely of steel and iron. Everything about a gypsum plant should be very strong and substantial.

The necessary machinery for making the above mentioned quantity of calcined plaster will weigh about 75,000 pounds. It will take about 125 horsepower to drive it, and will cost in the neighborhood of $10,000. The cost of mining the gypsum depends upon circumstances, and varies from 25 cents per ton up. The cost of manufacturing this product in quantities of not less than 50 tons a day, will be about $1 a ton, counting 10 per cent depreciation of machinery, which is ample, 6 per cent interest on the investment of say $10,000, and allowing 30 cents a ton for mining.

As above stated, calcined plaster of paris is used in making ready-made plaster. In fact, it is the base of all of this product, and is generally used in the proportion of one-third calcined plaster to two-thirds dried sand, with a small amount of hair and retarder. The retarder is necessary to prevent the plaster from setting too quickly. For stone or brick work the proportion of calcined plaster is about one-fourth. Wood fiber is largely used, also asbestos fiber, which is preferred by some.

DUTY ON FERRO-ALLOYS.

Recourse is to be taken to the courts for final decision in a case considered recently by the United States Board of General Appraisers, in which the duty on ferro-tungsten, ferro-chrome, ferro-vanadium and ferro-manganese is involved. In the case at issue the Midvale Steel Co. sought to bring in these ores with a duty of $4.00 per ton, under section 7 of the similitude clause of the tariff act of 1898. This has been the customary procedure, but the treasury department contended that a 20 per cent ad valorem duty should be levied, classing the importations as "metallic mineral substances in a crude state and metals unwrought not specifically provided for in the tariff law." A number of scientific men were called by the government in support of its contention. The case is one of extreme importance to the steel industry and the advance will be vigorously resisted. Former rulings on the question are conflicting.

STEEL CORPORATION REPORT.

(Continued from page 584.)

The net profits of the Tennessee Coal, Iron & Railroad Co. for the year 1907, after charging off $437,666.84 for depreciation and extraordinary replacements, and $885,552.31 for net interest charge on bonded and floating debt, were $1,426,684.58.

Improvement Expenditures.

Extensive outlays were made during the year for construction and improvement work. The total amount expended aggregated $6,589,116.99. The outlays covered additions and betterments as follows:

Land and real estate account	$ 71,936.41
Extensions and betterments at ore and coal properties	1,259,017.77
Improvements at Bessemer rolling mills	4,592.87
Additions, extensions and betterments at Ensley furnaces, steel works and rolling mills	5,253,569.94
Total	$6,589,116.99

Manufacturing Properties.

Some of the principal additions of the subsidiary companies on account of which expenditures were made during the year 1907 amounting to $23,329,673.09 are as follows:

CARNEGIE STEEL CO.—Additions completed during year: At Duquesne steel works—New spike machinery, including buildings and furnaces for same. At Mingo works—Additional soaking pit. At Columbus works—New sheet bar mill. Purchase of 22 acres of land adjoining Ohio works, and 8 acres coal land adjoining property at Bellaire works.

Work in progress: At Duquesne works—Two new blast furnaces; 18 new open-hearth furnaces; electric power station; gas cleaning plant; one 2,000-kilowatt steam driven generator, including buildings. At Homestead steel works—New 72-inch plate mill; additional facilities at 23-inch, 35-inch, and 40-inch structural mills. At Carrie furnaces—Two new blast furnaces; additions to electric power plant. At Ohio works—Two new blast furnaces; 12 open-hearth furnaces complete; new blooming mill; new bar and hoop mills. At Waverly—New storage warehouse and shops.

ILLINOIS STEEL CO.—Additions completed during year: At South works—New light rail mill; new 30-inch universal plate mill. At Joliet works—New blast furnace and new pig iron casting machine; new warehouse for storing spikes, bolts, nuts, etc.; new pattern storage warehouse; new hot bed and flying shears at No. 3 rod mill; two additional spike machines. Purchase of 1,278 acres of limestone property.

Work in progress: At South works—Two additional gas driven blowing engines; ore, coke and limestone pockets at blast furnaces Nos. 1-4; extending electric station, including gas cleaning and washing machine; two additional steam turbines direct connected to two 1,000-kilowatt generators; two rotary converters in sub-stations at north and south ends of plant; new pumping engine at central station and additional 24-inch water line; new coke storage yard at Stockton, Ind. At Joliet works—by-product coking plant, Koppers type, 275 ovens. At North works—New paint mill.

CEMENT PLANTS.—New cement plant No. 4 at Buffington, Ind., was completed during the year. Cement plant No. 5 at Universal, Pa., was placed in operation in December, the construction work being practically completed.

THE LORAIN STEEL CO.—Work in progress: At Johnstown works—Enlargement of plant for manufacture of frogs, crossings, street and steam railway special work. The additions will about double the capacity of the plant.

THE NATIONAL TUBE CO. (Lorain, O.)—Work completed during year: One new blast furnace; new 10-ton locomotive crane.

Work in progress: Open-hearth plant, six 50-ton furnaces; additional 6-hole pit furnace, and two additional gas producers; new galvanizing plant.

NATIONAL TUBE CO.—Work completed during year: National department—New blast furnace complete; new switching locomotive. Riverside department—New ore bridge at furnace "B."

Work in progress: The work of enlarging and rebuilding the National works at McKeesport was continued during the year 1907. As stated in the previous year's report, this work will not be entirely completed until in 1908.

SHELBY STEEL TUBE CO.—At Ellwood City, Pa., work was continued during the year in the rebuilding and enlargement of the seamless tube mills. The work comprehends the ultimate removal to and concentration at Ellwood City of several of the smaller outlying plants of the company. The additions and improvements will largely increase the annual productive capacity of seamless tubes. One-half of the cost of the new work only is being charged to capital account.

AMERICAN STEEL AND WIRE CO.—Work completed during year: At Newburg steel works—New open-hearth furnace. At Newburg wire works—New sulphate of iron plant; new warehouse building; new wire drawing equipment; new cleaning equipment and building extension. At Waukegan works—Additional mattress drawing and tinning equipment. At Rockdale works—Extension to building. At Trenton works—New 300-kilowatt generator and 500-horsepower gas engine. At Worcester works—Purchase of additional real estate; new sulphate of iron plant at north works; new building and stranding machinery at rope works. Purchase of six acres land at Neville Island works. Purchase of rod mill and wire plant of the National Steel & Wire Co., located at New Haven, Conn.

Work in progress: Newburg wire works—Additional cold rolling machinery. Central furnaces—Addition to power plant. Central furnace docks—Extending dock and installing ore handling equipment. Waukegan works—Enlarging spring mill building; new spring machinery; testing machine, tools, etc.; additional fine wire blocks. Rankin works—New warehouse. Braddock works—Additional wire drawing blocks. Allentown works—New wire mill engine and wire drawing equipment. Trenton works—Additional equipment for manufacture of wire rope and high grade wires. Cuyahoga plant—New mill for rolling flats. River division—Ten additional steel barges. Worcester works—Additional buildings and equipment for the manufacture of insulated wire and cables; additional paper cable equipment; additional rope machinery; extension to building and additional equipment in spring department; new warehouse and siding at Central department.

AMERICAN SHEET & TIN PLATE CO.—Work completed during year: At Vandergrift works—New sulphuric acid plant; eight additional hot mills and equipment; addition to galvanizing department. At United States works—Four additional galvanizing pots. At Dover works—Additional hot mill complete. At Sharon works—New sulphate of iron plant.

Work in progress: At New Philadelphia works—One additional jobbing and one sheet mill. At Scottdale works—New galvanizing department. At Guernsey works—Four additional sheet mills. At Canton foundry—New furnace, including casting pit, yard crane and crane runway; additional roll machinery.

AMERICAN BRIDGE CO.—Work completed during year: At Ambridge plant—Building and equipment for a foundry cleaning shop; extending crane runway and installing four electric traveling cranes. At Edgemoor plant—New boiler house and boilers.

Work in progress: At Elmira plant—Construction of a new bridge plant having an annual capacity of 40,000 tons of finished structural work. The new plant is of modern type in every particular. Only 40 per cent of the cost is being charged to capital account.

UNION STEEL CO.—Work completed during year: At South Sharon works—Addition to soaking pit building. At Donora works—New billet mill; additional four-hole soaking pit; additional 1,000 horsepower of boilers and stokers; extension to stripper building; two miles of yard tracks; new sulphate of iron plant.

Work in progress: At South Sharon works—New shop building and overhead crane runway. At Donora works—New sewers; new triple expansion pump; 15 standard gage cars; additional wire drawing equipment.

CLAIRTON STEEL CO.—Work in progress: New 22-inch structural mill; new 14-inch structural mill; new steam driven generator, engine, etc., in power plant; new 24-inch water line and two 10,000,000-gallon centrifugal pumps.

Coal and Coke Properties.

Total expended during the year by all coal and coke companies, $4,093,283.65. There were acquired during the year by purchase, 63 acres of coking and coal land, and 706 acres of surface land located in the Connellsville region. There was purchased during the year an additional interest of 36.4 per cent in the stock of the Hostetter-Connellsville Coke Co.

In the Connellsville, Pa., field there was expended $1,834,893 in the construction of four additional bee-hive oven coke plants, including all equipment and accessory works for same, together with additional tenement houses. These plants are located as follows: At Phillips, 400 ovens; at Collier, 400 ovens; at Dearth, 250 ovens; and at Ronco, 350 ovens. These will be completed in the early part of 1908.

At South Sharon by-product plant there was completed a new coal crushing and mixing plant.

In the Pocahontas, W. Va., field there were completed and put in operation during the year a coal breaker and washer, and a considerable quantity of mining machinery and equipment, including 12 coal mining machines and seven coke drawing machines. During the year expenditures amounting to $659,869 were made in the opening and equipping of four new coal plants. This work will be completed in 1908.

Iron Ore Properties.

Total expended during the year by all ore companies, $5,954,797.07. The foregoing aggregate expenditure by the iron mining companies covers, in addition to the equipment and construction mentioned below, outlays made for acquirement of sundry ore leases and timber property; also expenditures made in exploring and opening up mines on new ore properties.

The expenditures as above cover the cost of the following additional standard gage equipment acquired by the mining companies for use in conducting stripping and mining operations at open pit mines, viz.: 49 locomotives, 28 steam shovels, 849 stripping, dump and work cars, three flat cars and one wrecking car. Total expenditure account of the foregoing equipment, $1,117,331.65.

Expenditures were made during the year for important construction and development work at various mines as follows:

Chapin mine—New boiler house and plant; new pumping plant. Norrie-Aurora mine—Additional tramming equipment; new track system. Davis mine—Nine new dwellings; one Corliss compressor. Geneva mine—New engine house and hoisting plant. Pioneer mine—Additional electrical equipment. Zenith and Savoy mines—New dry house. Stephens mine—New repair shop and power plant. Clark mine—New dry house and new underground tramming system. Genoa mine—New engine and boiler house, shaft house and pumping plant. Adams mine—15 new tenements. Glen mine—New power plant and shaft house; new underground tramming system. Hull mine—New engine house and additional shop tools. Sellers mine—Four new tenements; five miles new mine tracks, including new steel bridge over G. N. Ry. Spruce mine—New shaft house and equipment; new boiler plant; new pumping plant and compressor; underground tramming and lighting plant. Monroe-Tener mine—25 new dwellings; new dry house; additional shop tools. Hartley mine—New engine house; additional shop tools; new mine tracks. Mountain Iron mine—17 new dwellings and employes' club house. At the Gilbert, McKinley and Canisteo-Holman mines a large amount (equaling about $635,000) of development and construction work was done, comprising all classes of improvements incidental to the opening of these new mines. The work includes the erection of a large number of dwellings for employes, and various municipal improvements in the development of the new town of Coleraine, near which the Canisteo and Holman mines are located.

Transportation Properties.

Total expended during the year by all transportation companies amounted to $13,194,074.61. The expenditures cover the cost of the following additional equipment acquired by the several railway companies, viz.: 89 locomotives, four passenger cars, two observation cafe cars, one combination coach, 39 cabooses, 2,101 steel gondola cars, 1,943 steel underframe gondola cars, 2,450 steel ore cars, 501 steel hopper cars, 520 box cars, 80 flat cars, 10 refrigerator cars, 59 convertible dump cars, 50 steel dump cars, one locomotive crane, one wrecking crane and one pile driver. Total expenditure account of the foregoing equipment, $8,928,606.39.

Payments amounting to $1,458,732.89 were made in 1907 covering the balance of the purchase price of four new 12,000-ton steamships contracted for in 1906. These boats are additional units to the fleet of the Pittsburg Steamship Co.

Various expenditures were made during the year by the following companies for important construction work, to wit:

By Monongahela Southern R. R. Co.: Additional expenditures were made during 1907 for completion of the line of railway from a connection with the Union R. R. near Duquesne plant of Carnegie Steel Co. to a connection with the Wabash Ry. system.

By Lake Terminal R. R. Co.: Purchase of railroad bridge over Black River, Lorain, O.

By Newburg & South Shore Ry. Co.: Purchase of 11 acres of land and 16 lots; interlocking plant between Central furnaces and Newburg works, and inter-locking plant and changing grade at the crossing of the C. & P., W. & L. E., B. & O. and N. & S. S. railways; various new yards and sidings, $57,636.20.

By Elgin, Joliet & Eastern Ry. Co.: Purchase of additional terminal property, East Joliet; various new yards and sidings, $43,256.74.

By Chicago, Lake Shore & Eastern Ry. Co.: Double track swing bridge over canal, Indiana Harbor, $14,688.62; various new yard tracks and sidings, $56,065.30.

By Duluth & Iron Range R. R. Co.: Account construction additional steel iron ore dock at Two Harbors, of 384 pockets, including approach, $218,521.32. New spurs to mines, yard and passing tracks and new station buildings were constructed at various places.

By Duluth, Missabe & Northern Ry. Co.: Construction of new coal dock at Duluth, capacity 650,000 tons, $397,441.90; 50 dwellings for employes at Proctor, $53,233.75; spurs to mines, yard and passing tracks and new station buildings constructed at various places, $938,945.72.

By Pittsburg & Conneaut Dock Co.: Expenditures amounting to $169,446.80 were made during the year 1907 for account of additional ore handling machinery at Dock No. 4 and for extension of the dock and new office building.

Miscellaneous Properties.

Total expended during the year, $181,307.68. The expenditures comprehend outlays by various land companies for purchase of additional real estate and erection of dwellings; the construction of additional store buildings by the supply companies; the acquirement of additional natural gas territory, etc.

Improvements and Extraordinay Replacements.

The expenditures for improvements and extraordinary replacements were paid from funds provided currently from earnings to cover requirements of the character included herein. The expenditures for the year are classified by property groups as follows: Manufacturing properties, $14,886,969.81; coal and coke properties, $773,549.51; iron ore properties, $428,141.74; transportation properties, $3,861,547.44; miscellaneous properties, $374,376.30. The total expenditures amounted to $20,324,584.80.

The principal improvement and replacement work covered by these expenditures is shown below:

Carnegie Steel Co.—Work completed during the year: Edgar Thomson works—New machine shop; new 24-inch steam line furnaces to steel works; raising roof of No. 1 rail mill and installing three electric traveling cranes, etc.; one 230-ton metal mixer. Duquesne works—Remodeling 26-inch and 21-inch mills; new shear for 13-inch merchant bar mill; changes in splice bar department. Homestead steel works—New electric crane and crane structure; new electric crane for roll shop. Carrie furnaces—New storage battery at D. C. station. Isabella furnaces—Condenser plant. Ohio works—New condensers for blooming and continuous mill engines. New Castle works—Additional soaking pit and extension to buildings, etc.; slag handling arrangement at Furnace No. 1; new gas washer. Sharon works—Improvements at blast furnaces. Painter mills—Two new boilers; new continuous furnace.

Work in progress: Edgar Thomson works—Three new compound condensing engines at rolling mills; storage battery plant and booster; additional hot bed and changes to finishing department of rail mill No. 2; alterations at converting department and rail mills; new ore yard and ore handling machinery; new electric power station; seven pairs compound blowing engines; new boilers at furnace department. Duquesne works—New pattern storehouse; extension to machine shop and additional machine tools; reinforcing crane runways of open-hearth building; one motor driven pump for river pump house; new engine on 40-inch blooming mill. Homestead works—New water purifying system; extension to machine shop and additional tools; mold and scrap yard with overhead crane; crane runway, over shears at 32-inch mill, extension to tables, etc. Howard Axle works—Improved facilities for charging billets. Lucy furnaces—Reconstruction of furnace No. 1; two new blowing engines. Ohio works—New 43-inch blooming mill; new 1,000-kilowatt generator, gas engine, extension to buildings, etc. Bellaire works—New river pumping plant.

Illinois Steel Co.—Work completed during the year: South works—Remodeling blast furnaces Nos. 1, 2 and 3; installing 40 Stirling boilers at blast furnaces Nos. 1 to 4; rearranging hot blast stoves at furnaces Nos. 5 to 8; two new 50-ton mixers; moving steel trestle at north dock. Joliet works—Improvements to blast furnace No. 2; new crusher building at converting department; overhead trolley runway from No. 3 rod mill to spike factory; new splice mill; new roll shop. Milwaukee works—New 12-inch train engine and roughing rolls and improving 8-inch, No. 1-9-inch, No. 2-9-inch and 12-inch mills; remodeling 21-inch and 22-inch mill; new 40-ton crane; new 20-ton locomotive crane with grab bucket. North works—Improving finishing end at structural shop.

Work in progress: South works—New pressure pumps at furnaces Nos. 1 and 4; new dry blast plant; new machine shop; new hot saw and extension of finishing department and new cold saw building; increasing heating capacity and remodeling the finishing end of 132-inch and 90-inch plate mill; extension to foundry; new concrete dock at north slip. Joliet works—New hot bed at billet mill; overhead trolley runway from merchant mill to bolt and nut factory; rebuilding billet mill furnace; remodeling blast furnace No. 3. Milwaukee works—New 500-kilowatt gas engine driven generator; installation for utilizing surplus blast furnace gas. North works—Additional steam and blowing capacity at blast furnaces; repairing river dock.

National Tube Co.—Work completed during the year: National department—Remodeling furnace "B"; new stove for furnace "B". Continental department—One single track electric crane. Riverside department—New steam blowing engine; new six-wheel connected locomotive. Pennsylvania department—One 375-kilowatt direct connected generator and engine; installing 1,000-horsepower boilers.

Work in progress: National department—New pump house and fire protection system; three blowing engines and three 500-horsepower boilers at furnaces; new electric crane and runway; reconstructing 72 skelp cars; remodeling furnace "A". Riverside department—Installing electric generator and engine at power plants. Pennsylvania department—Two new lap weld furnaces and bending furnace for each; building 1,700 feet of concrete wall along harbor line. Work was continued during the year in remodeling, rebuilding and enlarging McKeesport plant (remaining one-third cost is charged construction).

National Tube Co.—Work completed during the year: Lorain works—Condensing plant and two shape mill reversing engines; one heating furnace and three gas producers; rotary shears and extension to finishing end of plate mill; improvements at foundry; new machinery for making rifled pipe; tracks across reservoir to slag dump; three oil distributing plants; additional tools in machine shop.

Work in progress: Lorain works—Mechanical rail stock yard for handling rails; improvements in converting mill; table and skelp piler for No. 3 skelp mill; two electric overhead traveling cranes; six additional threading machines; laying concrete floor in power houses.

Shelby Steel Tube Co.—Work was continued during year in concentration and rebuilding of seamless tube mills.

AMERICAN STEEL & WIRE CO.—Work completed during the year: Newburg steel works—New water purifying plant; one 15-ton crane. Newburg wire works—New galvanizing plant and new equipment; electric light unit and power equipment; new box painting outfit. Central furnaces—Electric line to Newburg wire works; 12 iron ladles; six cinder cars; improving tops of furnaces 1 and 2; new stove at blast furnace No. 2. Waukegan works—Installing mechanical stokers, coal and ash handling machinery; additional high pressure pump. Shoenberger works—Installing coal crusher; installing mechanical stokers and ash handling machinery; improvements in horse shoe factory; new electric repair shop. Rankin works—New storehouse; equipment for unloading barges at river bank. American works—Shore protection on lake front; new fire pumps, hydrants and piping. H. P. works—Improvements to power plants for all departments; new paper box machine. Salem works—New machine shop; 10 third German spring nail machines. De Kalb works—Additional electric unit; improvement at boiler plant; changes in nail cleaning department; enlarging warehouse. Rockdale works—Enlarging electric galvanizing outfit. Scott street works—Conveyor for barb fence machine. Anderson works—Warehouse for galvanized wire and barb fence; new barb fence building. Worcester, north works—Pumping engine to furnish water for yard mills and improvement of water system; equipment for manufacture of diamond dies; changes in No. 6 annealing and charging house. Worcester, south works—Economizer equipment for boiler plant; new gas driven electric unit; additional equipment in open hearth department. Worcester, electrical works—New storehouse. Pacific works, San Francisco—New traveling crane and improvements to wire machines.

Work in progress: Newburg steel works—New slag crushing plant; rebuilding four open-hearth furnaces; compounding reversing engine in blooming mill. Newburg wire works—Extending machine shop. Central furnaces—Gas washers for blast furnaces. American works—Electric power plant; rebuilding boiler plant and installing coal and ash handling machinery. Consolidated works—New sprinkler system. H. P. works—New warehouse. Waukegan works—New billet handling equipment; additional annealing equipment; installing a 20-wire galvanizing outfit. De Kalb works—Compounding engine. Rockdale works—Rearrangement of galvanizing outfit. Anderson works—New water purifying plant. Shoenberger works—New plate mill building; centrifugal motor driven pump. Rankin works—Automatic sprinkler system; new rod mill engine; mechanical stokers and ash handling machinery. Braddock works—New water purifying plant; electric power plant; rod mill improvements. Allegheny furnace—Two new hot blast stoves; new pumping plant. Allentown works—New water purifying plant; electric power plant; improvements in rod mill. Worcester, north works—Additional electric unit. Worcester, south works—Compounding and condensing engine; improvements in rod mill. Worcester, central works—New boilers and stack.

AMERICAN SHEET & TIN PLATE CO.—Work completed during the year: Vandergrift works—New pump and standpipe; two 50-foot plunger cranes in the blooming mill. Shenango works—Installing coal handling plant and mechanical stokers. National works—Extending building to cover entire boiler plant. Aetna-Standard works—New steel coal trestle; rebuilding coal trestle; changing coal mine haulage to electric power; changing heating and annealing furnaces from gas to coal burning; new steel runway and 20-ton traveling crane. Laughlin works—Extension to power house and generator and engine. New Castle works—One additional annealing furnace. United States works—New water purifying system; one 20-ton crane. Pennsylvania works—Converting mill from six to eight-mill plant, etc. Wellsville works—Changing furnaces from gas to coal burning. La Belle works—Changing furnaces and tin pots from gas to coal burning.

Work in progress: Vandergrift works—Stripping plant and equipment; new 500-kilowatt generator; installing gas producers for the open-hearth department; crane runway with two 10-ton cranes; converting furnace from gas to coal burning; new storage warehouse. Aetna-Standard works—Changing galvanizing pots from gas to coal burning; two traveling cranes. Laughlin works—New pumping plant; converting tin and terne pot settings from gas to coal burning. Dover works—New building and crane runway over hot mills Nos. 1 to 6; new corrugating machine. La Belle works—Coal and ash handling facilities at boilers and mill furnaces. Scottdale works—General improvements to plant. Leechburg works—Addition to annealing building and two additional annealing furnaces. Guernsey works—Three new Stirling boilers, including stacks, etc.

AMERICAN BRIDGE CO.—Work completed during the year: Pencoyd plant—Elevated track system to steel mill charging floor of open-hearth furnaces; new crane for 28-inch mill yard. Edgemoor plant—Three electric motors. Shiffler plant—Electric motors to replace line shaft and belt driven mechanism. Toledo plant—Two light reaming gantrics and three mechanical stokers. Detroit plant—New electric traveling crane and new coal trestle. Lassig plant—Rotary planer, three riveters, punch and six electric hoists. Milwaukee plant—One five-ton crane; new boiler and extension to boiler house.

Work in progress: Pencoyd plant—New locomotive crane; bell drop; eight mechanical gas producers; renewing 12-inch mill hot bed and crane for same; new pumping engine; settling and storage tank, piping, etc.; improvements at blooming mill; moving furnace in 28-inch mill; improvements to the 20-inch and 23-inch mills. American plant—Plate straightening rolls; radial drill; track connections to P., F. W. & C. Ry. Shiffler plant—New building for boiler house; power house and office; new boiler; generator; additional electric lamps and wiring. Elmira plant—Construction of new plant.

UNION STEEL CO.—Work completed during the year: South Sharon works—Bridges and tracks across the Shenango river; two 20-ton cranes; new 20-ton electric overhead crane; two crane trolleys at open-hearth department. Donora works—New water purifying plant; seven blast furnace cinder ladle cars. Mercer works—New 30-ton electric crane.

Work in progress: South Sharon works—Ten additional ore bins at blast furnaces; remodeling cantilever bridge; enlarging storage yard; three electric ore transfer cars and trolley line; equipping boilers with stokers and ash handling machinery. Donora works—New blast furnace warehouse.

CLAIRTON STEEL CO.—Work completed during the year: Clairton works—Additional soaking pits in blooming mill; new gas washer plant; changing 18-inch bar mill to a structural mill.

Work in progress: Clairton works—Changing location of 12-inch gas line; remodeling open-hearth building; cranes, etc.

Coal and Coke Properties.

H. C. FRICK COKE CO.—Work completed during the year: Calumet works—Additional boiler and pumping equipment. Continental works No. 1—New coke drawing machine. Davidson works—Installing larger fan and increasing pumping facilities. Edenborn works—Brick arch over portion of landing at shaft bottom. Footedale works—Additional generator and engine. Hopewood works—New fan. Kyle works—Two electric locomotives. Leith works—Additional power and pumping equipment. Lemont works No. 2—New pumping station. Standard works—Additional power and pumping equipment. United works—Waste heat flues. Wynn works—170 new coke ovens and equipment. For various works—Installation of 12 coke drawing machines.

Work in progress: Continental No. 1—Installing tail rope haulage; installation of coke drawing machine. Continental No. 3—New fan. Davidson works—New steam pump and new boilers. Dorothy works—Additional mine pump; boilers; extending boiler house, etc. Edenborn works—Installing tail rope haulage; new fan. Hecla No. 1—Installation of coke drawing machine. Leisenring No. 2—Bin extension. Leisenring No. 3—Bin extension. Lemont No. 2—Installation of coke drawing machine. Redstone works—Additional duplex pumps; supply and shop building. South West No. 1—Additional power and pumping equipment; installation of mine haulage. Standard works—New shaft and equipment. United works—Additional power and pumping equipment. Miscellaneous—Installing over-winding device in 22 shafts.

Ore Properties.

Work completed during the year: Lake Superior mine—New boiler house and water tank for boiler plant; changes in shaft timbering. Champion mine—New roof to boiler house; coal trestle; remodeling blacksmith shop. Chapin mine—Two air cylinders for hydraulic plant. Aragon mine—Office and warehouse; repair shop and equipment. Norrie-Aurora mine—Addition to office building; electric fan and compressor improvements; hoisting plant for shaft "C" Pabst; new drums for hoisting plant. Pioneer mine—New frame dwelling and lot; six motors for underground tramming. Mountain Iron mine—Warehouse and extension to office; coal dock; electric light and power plant. Clark mine—Moving shaft house and buildings. Adams mine—Warehouse and coal dock; water pipe line. Spruce mine—Eight-inch air line connecting Adams, Spruce and Fayal mines.

Work in progress: Blue-Queen mines—Two change houses; captain's office; machine, carpenter and blacksmith shop; office and warehouse; boiler plant; water tank; coal dock; hoisting plant; pumping plant. Lake Superior mine—30 tram cars; new boiler house and boilers. Chapin mine—Pumping plant changes; cornish pump and pump extensions; 125 underground tram cars. Norrie-Aurora mine—New hospital; hoisting plant changes. Pioneer mine—Laboratory and crusher house; generator for underground tramming. Mountain Iron mine—Pumping plant. Hull mine—Office buildings. Spruce mine—Shaft house and heating system.

Transportation Companies.

BESSEMER & LAKE ERIE R. R.—Expenditures aggregating $1,004,972.47, included $387,149.59 for new second tracks; $16,598.07 for sundry items of right-of-way; $262,871.20 for new shops at Greenville and for office, station and other buildings; $232,778.33 for tracks, sidings and crossovers; $4,465.19 for telegraph and telephone lines and interlocking system; $24,380.08 for one pile driver, seven hopper cars, and rebuilding caboose and flat cars; $76,730.01 for sundry betterments.

UNION R. R.—Expenditures to the amount of $588,081.32, included $189,165.98 for second tracks; $139,287.14 for building a connection from the Monongahela river bridge to tracks on the river bank; $132,260.59 for enlarging Oak Hill yard, including additional real estate. The balance was expended for sundry betterments.

ELGIN, JOLIET & EASTERN RY.—Expenditures aggregating $403,226.34, included $383,208.08 for four switch engines and 300 steel underframe gondola cars purchased for replacement; $11,685.96 for bridges, trestles, etc.

CHICAGO, LAKE SHORE & EASTERN RY.—Expenditures aggregating $658,028.84, included $596,301.70 for 350 steel side dump, 100 steel underframe flat, 11 work and two way cars, purchased for replacement. The balance was expended for sundry tracks, bridges, etc.

DULUTH & IRON RANGE R. R.—Expenditures aggregating $649,932.90, included $316,822.55 for rebuilding ore dock No. 5, Two Harbors; $55,269.81 for rebuilding coal dock, Two Harbors; $13,009.69 for new central electric power plant, complete, Two Harbors; $47,142.21 for reconstruction of six bridges. The balance was expended for sundry tracks, trestles and additions to buildings, and rebuilding sundry freight cars.

DULUTH, MISSABE & NORTHERN RY.—Expenditures aggregating $174,083.77, included $100,000 for part cost of new coal dock, capacity 350,000 tons, at Duluth. The balance was expended for sundry tracks, additions to building and other sundry improvements.

PITTSBURG STEAMSHIP CO.—Expenditures aggregating $199,564.82, included $30,784.78 for final charge account cost of four new 12,000-ton steel steamers purchased for replacements in 1906; $11,901.65 for one-half cost for dredging ship channel from D. M. & N. Ry dock, Duluth, to the Superior ship channel; $147,878.39 for sundry improvements to the boats.

PITTSBURG & CONNEAUT DOCK CO.—Expenditures aggregating $24,315.42 were made for changing ore unloaders to operate by electric instead of by steam power.

PENNSYLVANIA & LAKE ERIE DOCK CO.—Expenditures aggregating $157,185.34, included $114,217.11 for account of six Brown electric unloading machines; $34,185.14 account electric power plant; $41,244.58 account construction of new dock; $10,296.17 account boiler plant. The balance was expended in connection with above improvements.

Miscellaneous Properties.

CARNEGIE NATURAL GAS CO.—Expenditures aggregating $369,553.20, included $265,070.39 for installation of new pipe lines, and $103,221.70 for new Folsom gas pumping station, Wetzel county, W. Va.

Increases Its Board.—The Westinghouse Machine Co., Pittsburg, has increased its board of directors, and the following have been chosen to serve in that capacity: George Westinghouse, Pittsburg; H. H. Westinghouse, New York; Robert Wardrop, president People's National Bank, Pittsburg; James C. Chaplin, vice president Colonial Trust Co., Pittsburg; W. H. Donner, Pittsburg; Wm. McConway, president McConway & Torley Co., Pittsburg; Wilson A. Shaw, president Bank of Pittsburg, N. A.; Horace E. Smith, Philadelphia, and John F. Wallace, of the Electric Properties Co., of New York. This action is preliminary to presentation of an application to the federal court for the discharge of the receivers, which is expected to be made soon.

New Engineering Branch.—James H. Baker has opened offices in the Commonwealth building, Pittsburg, as a forging engineer, and will devote his attention to the execution of commissions in forging development, forging machinery, erection of plants, examination of plants, appraisement of plants, sale of plants, etc. This is a comparatively new branch of engineering, but Mr. Baker has had extensive experience in the forging line as a manufacturer, having at various times conducted the Baker Wagon Factory, the Baker Chain & Wagon Iron Mfg. Co., Pittsburg, Baker Forge Co., Pittsburg, and the James H. Baker Mfg. Co., afterwards combined with another forge and named the Solid Steel Tool & Forge Co. Mr. Baker resigned from the presidency of the latter company Dec. 1, 1907, to lay the foundation for the new branch of engineering.

A BURDEN ON COMMERCE.

A decision of interest to shippers in Pennsylvania was recently returned by Judge Evans, of the common pleas court of Allegheny county at Pittsburg, in which the court held the act of the state legislature of May, 1907, providing for a maximum charge of $1 a day for cars standing on sidings after the railroad company had notified the consignee of their arrival, to be unconstitutional. The Pennsylvania railroad had charged the M. O. Coggins Co., Pittsburg, produce dealer, for demurrage and storage according to its schedule of rates now in force, but the latter had refused to pay the bill upon the allegation that the charge violated the state law. In returning his decision, Judge Evans said:

"It seems clear that not only has congress legislated upon the subject involved in this case and committed to the interstate commerce commission the duty of determining the reasonableness of such storage charges, but the attempt on the part of the state of Pennsylvania to give to a consignee the possession of cars in which goods subject to interstate commerce have been shipped for an indefinite time in which to unload his goods in payment of $1 a day, is a burden on interstate commerce."

A recent holding of the New Jersey supreme court is that the stock of a foreign corporation is not taxable in New Jersey if the property of the corporation has been taxed in its own state within 12 months. This decision will eliminate from taxation a large amount of intangible personal property heretofore held to be taxable in New Jersey.

ARBITRARY STRIKE

Called Off After Big Damage to San Francisco Builders and Workmen.

(Special Correspondence)

San Francisco, March 20.—A strike which had tied up several of the most conspicuous structures, has finally been called off. It may be interesting to contractors, builders and owners of property to know how a few irresponsible workmen, on the merest pretext, can stop work on buildings representing investment of millions of dollars, depriving several hundred mechanics of work, and creating injury and damage to a large number of persons who have nothing in common with them, have no grievance, and are made to suffer by the vagaries of a few irresponsible fellows.

John D. McGilvray, a contractor of San Francisco, who has contracted for the construction of numerous large buildings, recently proposed to the derrick men in his employ that he preferred to pay their wages every two weeks instead of each Saturday, which, he claimed would be more convenient. They refused on the ground that the union rule demanded weekly payments. McGilvray accepted the decision and continued paying each Saturday, until the Saturday before Feb. 22, Washington's Birthday. That being a holiday, the banks were closed and McGilvray was unable to draw the money to pay his men, but promised to pay on the following Monday. They reported for work at the usual hour on Monday morning. The derrick men demanded their pay before they would start work. McGilvray explained that the banks open at 10 a. m., and that he could not draw any money until that hour. The derrick men refused to listen to his explanation, and the leader ordered the force to remain away from the work. When the banks opened two hours later, the derrick men had scattered, and McGilvray was unable to find them. The stationary engineers, stone masons and other mechanics, had to quit, because the derrick men failed to supply them, and work was stopped on the new custom house, the new Federal Trust building, Montgomery and Post streets, the St. Francis hotel, and a number of other large structures. Work has just been resumed. Although some had a voluntary vacation, many more suffered a week of enforced idleness, but all lost their earnings for that week, and the work is delayed.

The name of the Vandergrift Mfg. Co., Shelbyville, Ind., has been changed to the Monte Wrench Co.

TECHNICAL EDUCATION

Will be Discussed at National Metal Trades Association Convention.

The tenth annual convention of the National Metal Trades Association being held at the Hotel Astor in New York, this week, promises to be one of the most interesting conventions since the association was organized. Several prominent speakers will address the convention on important topics, relating to labor questions and technical education. The presentation of the co-operative plan as adopted in Cincinnati, in conjunction with the University of Cincinnati and the machine tool shops, in giving students an engineering course with practical shop experience promises to prove most interesting. F. A. Geier, president of the Cincinnati Milling Machine Co., will present the results of the experiment from the manufacturer's standpoint and Prof. Herman Schneider, of the University of Cincinnati, will deal with the results from the educational side of the proposition. These gentlemen recently appeared before the Chicago branch of the N. M. T. A. at its annual meeting and a resolution was adopted recommending to the N. M. T. A. the appointing of a committee for the promotion of definite plans along the line of industrial education.

Under the subject of "Recent Legislation" Anthony B. Dunlap, attorney for the association, will deliver an address relating to the trend of thought in reference to recent and proposed legislation.

The convention was called to order at 10 a. m. Wednesday and an address of welcome was delivered by Hon. Patrick H. McGowan, president of the board of aldermen, New York City. Reports of committees and officers followed. At the afternoon session, further reports were heard. In the evening there was a banquet of the members of the association and their guests in the banquet room of the Hotel Astor. An address was delivered on "Industrial Education" by Henry S. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching and National Society for the Promotion of Industrial Education, and on "Some Dangerous Modern Tendencies" by Hon. William H. Speer. There was also a vaudeville entertainment. Thursday morning, "Co-operative Engineering Course" will be discussed by Prof. Schneider and Mr. Geier. At the afternoon session there will be reports of the convention committees and election of officers.

TO MINE ORE.

Two Companies Projected to Develop New Alabama Discoveries.

Two new companies have just been incorporated for the purpose of mining and marketing Alabama iron ore. Development work will be undertaken in one field discovered near Tuscaloosa and in another near Russellville, Ala.

The discoverer of the Tuscaloosa find, C. M. Peterson, has organized a company including Mt. Pulaski and Lincoln, Ill., capitalists with an Illinois charter and these officers have been chosen: President, H. S. Pekenmeyer; vice president, S. M. Plant; secretary, S. F. Mayfield; treasurer, X. F. Biedler; director, C. M. Peterson. The field is located five miles east of Tuscaloosa. The ore shows 42 per cent iron and 10 per cent manganese. Exploratory pits disclose a vein 10 to 12 feet in thickness.

The Eureka Mining & Development Co. has incorporated with 50,000 capital stock to develop 415 acres of brown iron ore near Russellville. Two washers will be installed on the property which is located on the North Alabama railroad, a branch of the Southern railway. Main offices will be established at St. Louis and branch offices at Chattanooga and Birmingham. The company's officers are: President, P. J. Hannan, St. Louis; vice president, J. D. O'Gara, Bessemer, Ala.; secretary, P. E. Hickey, St. Louis; treasurer, J. F. Gallagher, Chattanooga; general manager, W. H. Baetty, Russellville.

OTIS ELEVATOR PROFITS.

The Otis Elevator Co. of New Jersey, at the annual meeting at Jersey City, March 16, made public the result of the operations of the three corporations, those of Pennsylvania and Missouri and Texas in the New Jersey corporation report. The report shows a satisfactory year for 1907, considering the crisis toward the close. The report shows a gain in net of $140,937 and of $55,000 in surplus.

	1907.	Increase.
Net earnings	$996,104	$140,937
Dividends (6 per cent preferred)	371,795	24,003
Dividends (3 per cent common)	191,259	.....
Depreciation	271,166	55,000
Surplus for year	161,934	61,934

The Belfont Iron Works Co. has placed an order for twin engines of 700-horsepower with the Ironton Engine Co., Ironton, O.

MEETING OF CENTRAL ASSOCIATION OF STOVE MANUFACTURERS.

The Central Association of Stove Manufacturers held its regular quarterly meeting in Cincinnati at the Hotel Havlin on March 16 and 17. Practically the entire membership was represented at the meeting, there being present about 25.

A resolution was adopted reaffirming the resolution of last December as to prices. This means that present prices will be maintained. It was the sense of the meeting that there was no occasion to reduce the present schedule, as there were no reports of price cutting, and prices were not advanced when the pig iron market reached extreme figures during the year. Labor costs are no lower, as the contract with the molders through the Stove Founders' Defense Association remains in force until April, 1909.

Plans for establishing a central purchasing agency for the purchase of pig iron were discussed and arrangements will likely be effected looking to the carrying out of this plan through harmonious working with the Iron Buyers' Association. This matter was referred to a committee to complete details.

The association is composed of the stove manufacturers of Western Pennsylvania, Ohio, West Virginia and Northern Indiana. The meeting adjourned to meet again in Columbus, O., in June. The officers of the association are: President, M. Hartenstein, of M. Hartenstein & Co., Columbus, O.; vice president, Frank Knauss, of the Portsmouth Stove & Range Co. of Portsmouth, O.; secretary, Allen Williams, of Lattimer & Williams, Columbus, O.; treasurer, Edw. W. Hake, of the Monitor Stove & Range Co. of Cincinnat.

Vote on Authorization.—At the annual meeting of the stockholders of the United States Steel Corporation, to be held in Hoboken, April 20, the stockholders will vote on the authorization of the acquiring of the property belonging to the Tennessee Coal, Iron & Railroad Co. At the meeting eight directors, to serve 13 years, will be elected.

Articles of incorporation were filed for the F. Grote Implement Mfg. Co., Evansville, Ind., last week, the capital stock being $50,000. Ferdinand, Emil, Ernest and Laura Grote and J. D. Carmody and William Hartman are directors.

FINISHED LINES WEAK.

Strong Competition Among English Manufacturers.

Office of THE IRON TRADE REVIEW, Princes Chambers, Corporation St., Birmingham, Eng., March 14.

The improvement in pig iron reported elsewhere has not had its parallel in the finished iron trade, which is still weak with makers generally scrambling for orders. But the dearer material has put a check upon the under selling. For unmarked bars £6 12s 6d is probably the minimum. As usual in times of depression, the common bar section is the weakest and subject to keenest competition, but the dearness of coal partly maintained by the prospect of an eight hours bill, and the heavy compensation charges to which colliery owners are subject, which is discouraging reductions. But the outlook is better with the export season in immediate prospect. There is a better demand also for galvanized sheets. The gas strip trade is dull, and in the wire line severe competition is being met with from Germany, which has knocked down prices about half a sovereign per ton.

A decided recovery is reported in steel, the bottom quotation for which in the matter of billets is £4 12s 6d. In some cases, this has been withdrawn and £4 15s insisted upon. Foreign competition now causes no concern whatever, partly because little is offering, but also on account of the irritating delays by the German and Belgian makers who recently rushed the market with offers of metal.

The annual meeting of the Midland Iron and Steel Wages Board has just been held. The feature of the year has been the wonderful maintenance of peace, so that only one meeting of the standing committee has had to be held. The chairman, George Macpherson, said he had never known a year when there was such loyalty to the board, and less friction. He attributed this largely to the wise guidance of the secretaries of the operatives, Messrs. Aucott and Cox, as well as to the excellent influence and advice of the representatives of both sides of the board. The speaker expressed his regret at the large number of firms which are not members, and make use of the board's findings without contributing to its expenses, or being ruled by it. The speaker sounded a note of warning with regard to the eight hours bill, which he anticipated would raise the price of fuel. The board decided to subscribe £50 to the fund to establish a chair of political economy at Armstrong college, Newcastle, as a memorial to the late Sir David Dale in appreciation of his great labors in the cause of conciliation and arbitration.

The pending eight hours bill has been the subject of rather frequent reference by local ironmasters and colliery owners, Mr. Cay, manager of the Patent Shaft & Axletree Co., estimating the probable addition to price at 1s 6d per ton.

A copy of this resolution was ordered to be sent to the home secretary and to all members of parliament who represent Midland constituencies.

The annual meeting of the South Staffordshire Mond Gas Power & Heating Co. just held was a somewhat depressing event, a loss having to be reported of £12,126. This shows that the expectations of the promoters that South Staffordshire ironmasters would be eager to use the gas for the production of their iron has not been fulfilled. The principal reason is that a special plant has to be built, the ordinary coal fire furnace being of no use whatever for gas purposes. All that can be said is that enterprising firms here and there are gradually taking up the gas and that where they have done so, they express themselves satisfied with the result.

Notwithstanding the dullness in the iron trade, the Leeds Forge Co. has been able to maintain its profits at 9s 6d per £3 share, transferring £15,000 to reserve and writing off £25,000 for depreciation. The return is really equal to 15 per cent on the ordinary capital.

Twin Reversing Engine.—The Mesta Machine Co., Pittsburg, has recently made shipment of a twin reversing engine to be direct connected to a roughing rail mill for the Tennessee Coal, Iron & Railroad Co., Ensley, Ala. The general dimensions of the engine are: Length over all, 50½ feet; width, 29½ feet; weight, 850,000 pounds; cylinders, 55-inch diameter by 66-inch stroke. The contract calls for operation with 150 pounds steam presure and a speed of 150 revolutions per minute, under which conditions and ¾ cut-off the engine will develop 27,000 horsepower. In general the engine is twin simple with piston valve gear, and following the usual Mesta custom is massive in construction, to stand the shocks and severe service encountered in rail mill work.

NEW ENGLAND FOUNDRYMEN'S ASSOCIATION.

The regular monthly meeting of the New England Foundrymen's Association was held at the Exchange Club, Boston, on March 11, with 40 present.

Communication was received from the New England Stove Manufacturers' Association asking the co-operation of the foundrymen's association in bringing about the adoption of a universal pig iron contract which will protect the interests of the buyer and be acecptable to the seller. Remarks were made by some of the members stating that in the past the sellers in most cases have insisted on having things their own way and made the contracts strongly in their favor, hardly recognizing the buyer, and they thought it was high time that the consumers should get together and the contracts amended so they might be afforded better protection in the matter of purchases. J. L. Anthony and B. M. Shaw were appointed a committee to act in conjunction with the Stove Manufacturers' Association in formulating such a contract.

The Debevoise-Anderson Co., New York City, was unanimously elected to membership.

The meeting then adjourned to dinner, after which the speaker of the evening, George N. Jeppson, of the Norton Co., Worcester, Mass., gave an illustrated talk on "Grinding Wheels," describing alundum and its manufacture, profits derived by use of grinding wheels, the machines on which they are used, proper mounting of wheels and their safety devices, and the selection of grinding wheels. The speaker's remarks were received with much favor.

Announcement was made that the next meeting of the association would be held in Boston on April 11, and the committee had arranged with T. E. Byrnes, vice president of New York, New Haven & Hartford Railroad, to speak at that time.

Many Individual Stockholders.—Recent announcement was made that the number of individual stockholders of the United States Steel Corporation has reached the aggregate of 95,000, the largest in its history. However, while the actual holders of record total 95,000, yet, since many of the banking and brokerage houses and syndicate carry stock for individuals, the roster of names of actual stock owners would probably be nearer to 125,000.

Steel Report Strengthens Market

Closely following the opening strength of the New York markets Monday, stocks later turned weak, and by Thursday several new low-points in industrials had been reached. Crucible Steel postponed the declaration of the quarterly dividend on preferred stock. Quarterly dividends on New York Central stock were reduced from 1½ to 1¼ per cent. The semi-annual dividend on the Union Typewriter was passed. Westinghouse Air Brake directors declared only the regular quarterly dividend of 2½ per cent, omitting the extra. Under this influence and the usual political rumors, the market dropped steadily until the announcement of iron and steel producers in New York to reaffirm old prices, and the publication of the strong report of the Steel Corporation for last year. On Friday the market strengthened, and on Saturday opened both active and firm, final changes being somewhat irregular owing to the profit taking. The New York bank statement was exceptionally favorable. The actual loans of clearing house banks increased $3,193,500; deposits increased $7,029,300; circulation decreased $248,000. The percentage of actual reserve was 28.55 per cent, an increase of 0.73. The statement of non-clearing house state banks and trust companies in Greater New York reported an increase in loans of $1,391,200; increase in total deposits $8,830,500, and increase in specie of $68,000. The percentage of reserve was 27.1. Money on call during the week ranged from 1¾ to 2 per cent. There was no special increase in demand. A favorable feature was the reduction in the Bank of England rate to 3 per cent, the lowest since 1905. High rates for money continue in Germany. At the call of Secretary Cortelyou, $21,000,000 of United States deposits were returned last Monday, but its influence had been discounted. Business failures in the United States for the week ending March 19 numbered 298, as against 278 last week and 157 in the like week of 1907. Bank exchanges for the week at leading banks in the United States were 40.2 per cent less than a year ago, and 17.2 per cent below those of the corresponding week of 1906. The loss is especially heavy in the east, south and San Francisco. The total number of shares dealt in for the week was 3,936,460, compared with 4,018,750 last week, and 5,743,450 the same period last year. The sale of bonds, exclusive of government bonds for the week, aggregated $10,222,000, compared with $11,853,000 last week and $10.135,000 the same period last year.

Copper Market

Boston.—Butte Coalition closed 20⅛, a net loss of ⅝; Calumet & Arizona closed 104, a net loss of 2; Calumet & Hecla closed 640, a net gain of 5; North Butte mining closed 53¾, same as last week; Quincy Mining closed 81, a net loss of 4.

New York.—Amalgamated Copper closed at 57⅜, a net loss of ¼.

Financial Notes.

Westinghouse Air Brake directors declared the regular quarterly dividend of 2½ per cent, but not the extra dividend, as customary, payable April 10; Pittsburg, Bessemer & Lake Erie Railroad Co., regular semi-annual dividend of 1½ per cent on common, payable April 1; American Screw Co., quarterly dividend of 1¾ per cent, payable March 31; Otis Elevator, 3 per cent on the common, payable in two equal installments, April 15 and Oct. 15; also quarterly 1½ per cent on preferred, payable April 15; Sloss-Sheffield Steel & Iron Co., regular quarterly dividend of 1¾ per cent on the preferred, payable April 1; American Shipbuilding, quarterly dividend of 1¼ per cent on common and preferred, payable April 1; Union Switch and Signal Co., regular quarterly dividend of 3 per cent on common and preferred, payable April 10.

THE LEADING INDUSTRIAL SECURITIES.

	Clos'ng Quo Mar. 21	Changes in Week	Date 1908 Ann. M't'g	Stock Outstanding	Dividend Basis	Dividend Last Declared	Dividend Date Last Div. Pay.
Allis-Chalmers	7⅛	+ ⅜	Sept. 3	19,820,000		.....	.....
Allis-Chalmers pr	20⅛	+2⅜		16,150,000	7 cum	1¾ Q.	Feb., 1904
American Can	4⅝	− ⅜	Feb. 3	41,233,300		.....	.....
Am. Can pr	47⅞	−1⅛		41,233,300	7 cum	1¾ Q.	Apr., 1908
Am. Car and Fdy	31	+ ⅝	June 25	30,000,000		1 Q.	Apr., 1908
Am. Car and Fdy pr	90¼	+1¼		30,000,000	7 n. c.	1¾ Q.	Apr., 1908
American Loc.	39⅛	+ ¾	Oct. 20	25,000,000	5	1¾ Q.	Feb., 1908
American Loc. pr	9[illegible]	+1		25,000,000	7 cum	1¾ Q.	Jan., 1908
American Ship	42½	−2½	Oct. 14	7,600,000	4	1	Mar., 1908
American Ship pr	94½	.....		7,900,000	7n. c.	1¾ Q.	Apr., 1908
Am. Steel Foundries	5½	.....	Oct. 6	15,810,000		.....	.....
Am. Steel Foundries pr	31⅛	+1⅜		17,240,000	6 cum	2¼	Aug., 1904
Barney & Smith	50	.....	June 2	2,000,000	4	1 Q.	Sept., 1907
Barney & Smith pr	105	.....		2,500 000	8 cum	2 Q.	Mar., 1908
Bethlehem Steel	12	−2	April 7	14,862,000		.....	.....
Bethlehem Steel pr	36	−2¼		14,904,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	20½	+ ⅛	March 17	45,000,000*	6	1½ S. A.	Feb., 1908
Cambria Iron	45¾	.....		8,468,000*	4	2 S. A.	Apr., 1908
Chicago Pneumatic Tool	22½	+ ¾	Feb. 17	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	21⅞	+1⅞	Oct. 19	34,235,500		1¾	Apr., 1903
Crucible Steel	5	− ⅛	Oct. 21	24,578,400		.....	.....
Crucible Steel pr	36½	−1		24,436,500	7 cum	1 Q	Dec., 1907
Empire Steel	8	.....	Feb. 26	2,281,400		.....	.....
Empire Steel pr	40	.....		2,500,000	6 cum	3 S. A.	Jan., 1907
Fay & Egan	100	.....	Feb. 18	1,000,000	6	1½ Q.	July, 1907
Fay & Egan pr	110	.....		1,000,000	7 cum	1¾ Q.	Aug., 1907
General Electric	122	+1½	May 12	65,167,400	8	2 Q.	Apr., 1908
Harbison-Walker	10	.....	Jan. 20	18,000,000		½	Oct., 1907
Harbison-Walker pr	68	+3		9,600,000	6 cum	1½ Q.	Oct., 1907
International Pump	24½	+ ⅛	June 2	17,787,300	1	1	Apr., 1905
International Pump pr	71¾	−1⅞		13,335,000	6 cum	1½ Q.	Feb., 1908
Lackawanna Steel	28	.....	March 11	34,971,400		.....	.....
Lake Sup. Corp	6¾	+1⅛	Oct. 7	40,000 000		.....	.....
New York Air Brake	65⅞	.....	June 18	8,012 500	8	2 Q.	Oct., 1907
Niles Bement-Pond	120	.....	Feb. 5	8,500,000	6	1½ Q.	Mar., 1908
Niles Bement-Pond pr	100	.....		2,000,000	6 cum	1½ Q.	Feb., 1908
Otis Elevator Co	29	+6	March 16	6,156 600		1½ S. A.	Apr., 1908
Otis Elevator Co. pr	78	+3		6,449.500	6 n. c.	1½ Q.	Apr., 1908
Penn. Steel	60	.....	May 11	10,750.000		.....	.....
Penn. Steel pr	90	.....		16,500.000	7 n. c.	3½ S. A.	Nov., 1907
Pittsburg Coal Co	9	+ ⅛	Feb. 10	28 297.600		.....	Nov., 1906
Pittsburg Coal pr	39⅛	− ⅛		27,246.800	7 c.	1¾	Apr., 1908
Pressed Stl. Car	22½	+ ⅝	Feb. 19	12.500,000		3	Aug., 1904
Pressed Stl. Car pr	79½	+ ⅛		12.500.000	7 n. c.	1¾ Q.	Feb., 1908
Pullman	170⅝	+ ⅛	Nov. 11	100,000,000	8	2 Q.	Feb., 1908
Railway Stl. Spring	33½	+ ⅞	March 5	13.500.000	4	2 S. A.	Apr., 1908
Railway Stl. Spring pr	80	.....		13,500.000	7 cum	1¾ Q.	Mar., 1908
Rep. Iron & Steel	18¼	+ ¾	Oct. 21	27.191,000		.....	.....
Rep. Iron & Steel pr	72⅝	+1⅝		20,416 900	7 cum	1¾ Q.	Apr., 1908
Sloss-Sheffield	50	−1¼	March 11	10,000,000	5	1¾ Q.	Mar., 1908
Sloss-Sheffield pr	91½	− ⅛		6 700,000	7 n. c.	1¾ Q.	Apr., 1908
U. S. Pipe & Fdy	21⅜	+1½	June 24	12,500,000	4	1 Q.	Dec., 1907
U. S. Pipe & Fdy. pr	67⅛	.....		12.500.000	7 n. c.	1¾ Q.	Mar., 1908
U. S. Steel	34½	− ⅛	April 20	508,302 500	2 n. c.	½ Q.	Mar., 1908
U. S. Steel pr	98	.....		360,281,100	7 cum	1¾ Q.	Feb., 1908
U. S. Steel 5's	93¾	+2⅛		463.798 000	5	5 A.	.....
Va. Iron, Coal & Coke	50¼	+1¼	Nov. 17	9,073,680		.....	.....
Westinghouse Elec	40	.....	June 24	23 933.200*	10	2½ Q.	Oct., 1907
Westinghouse Air Brake	94	+1	Oct. 6	11,000,000*		2½ Q.	Apr., 1908

Par value of shares, $100, except those starred (*), $50.

NEWS FROM MANY INDUSTRIES

New Buyers:—

The Comstock Brass Co., Cleveland, with a capital of $10,000, has these incorporators: C. W. Comstock, E. Leutke, H. B. Thornton, C. Zwilling and N. R. Wildman.

The Culm Furnace Co., Wilmington, Del., has been chartered with a capital of $300,000, by E. B. Waples, J. M. Horn and F. E. Janvier, all of Wilmington.

The Lake Erie Forging Co., Cleveland, has been chartered by the following: John A. Markley, J. C. Kapke, Walter H. Baker, C. R. Markley and H. G. Powell. The capital stock is $10,000.

The Modern Foundry Co., castings, tools, etc., has been incorporated with $10,000 capital by: President, Henry O. Nichols; treasurer and clerk, Everett E. Staples, both of Mansfield, Mass.

David J. Granger, Warren Pease and William Polkey have incorporated the Granger Forge Works, 120 East Adams street, Chicago. The company is capitalized at $60,000, and will engage in a general manufacturing business.

William B. Smith, James S. Caffrey and Harry L. Eamans, Syracuse, N. Y., have incorporated the Smith & Caffrey Co., Syracuse, to manufacture iron, steel, copper products, etc. The capital stock is $50,000.

The Small-Townsend Mfg. Co., St. Louis, Mo., with a paid-in capital of $25,000, has been incorporated by Chesley T. Small, H. S. Townsend, and John F. McDermott, to manufacture and deal in machinery, cans, etc.

The incorporation of the Karr Supply Co., Hackettstown, N. J., to manufacture machinery, farm implements, etc., has been effected by John Karr, Jennie Karr and James S. Karr, of Hackettstown. The capital stock is $100,000.

The United Sales Co., Cincinnati, to sell machinery, has been granted a charter. H. R. Hoper, M. A. Ostendorp, Lewis M. Guelich, G. B. Jolly and Alice Majoewska are the incorporators, and the capital stock is $10,000.

The board of control at the School for Feeble Minded Youth, at Winfield, Kans., announces that it will let the contract for the remodeling of the boiler house and for a 75-kilowatt generator and engine, April 29, at 2 o'clock.

Giant Steel Hame Tug Co., DeKalb, Ill., incorporated to manufacture and sell iron and leather, has a capital of $20,000, and its incorporators are: O. G. Norris, Edward Johnson and Charles N. Pritchard.

The Little River Iron Co., Pulaski, Va., with a capital of $100,000 has been incorporated with these officers: President, J. C. Wysor, Pulaski; vice president, C. W. Surface, Christiansburg, Va.; secretary and treasurer, J. L. Wysor, Pulaski, Va.

Sittman & Suren Mfg. Co., Brooklyn, N. Y., to manufacture tools, implements, etc., has been chartered by Gustav Sittman and Ferdinand Suren, 105 Liberty street, Brooklyn, and Lewis V. Hulse, 271 Broadway, New York City. Capital stock, $5,000.

The Mercantile Adding Machine Co., New York City, adding and computing machines, typewriters, etc., has been incorporated with $500,000 by the following. J. F. Mosby and Guy Osborn, 76 William street, New York City; and A. A. Kelley, Montclair, N. J.

The Brandon Mfg. Co., Yonkers, N. Y., civil engineer and builder of engines, dynamos, etc., has been incorporated with a capital of $25,000 by R. E. Buchanan, Cos Cob, Conn.; Merritt M. Pharo, Greenwich, Conn.; A. E. Woods, Yonkers, N. Y., and others.

W. O. Root, E. P. Gould and R. E. Root, Chicago, have secured a charter to manufacture and deal in metallic packing under the firm name of the High-Speed Metallic Packing Co. The new company is capitalized at $12,000, and is located at 135 Adams street, Chicago.

The Automatic Switch Co., of Mobile, Ala., with a capital of $10,000, has been chartered by the following: G. J. Crossland, W. J. D. Branscom, Elliott G. Ricarby and W. A. Gould. The company will manufacture, promote and sell mechanical and electrical machinery and appliances.

The Waxahachie Foundry & Machine Co., Waxahachie, Tex., has been organized and a charter applied for. Those interested in the new enterprise are J. T. Andrews, W. A. Baird, E. W. Rice and E. L. Pierson. The company is capitalized at $10,000, and will be located on South Rogers street.

Articles of incorporation have been secured by James Stewart Andrews, 21 Park Row; Alexander Gulick and Archie W. Palmer, 170 Broadway, New York City, to manufacture and deal in railroad supplies and equipment, machinery, etc., under the name of the Metal Ties Co., with $100,000 capital stock.

The Reed Machinery Co., York, Pa., has been granted a charter to manufacture and sell bakers' machinery and similar appliances. The capital stock of the new corporation is $15,000, divided into 150 shares of $100 each. The directors are H. Read, York, Pa.; W. T. Dehuff, and C. L. Moody, of Glen Rock, Pa.

A certificate of incorporation has been granted to the Klervin Co., Auburn, N. Y., to manufacture smoke preventives, consumers, etc., with a capital of $50,000. Frank S. Messenger, Auburn, N. Y.; Ray S. Messenger, Geneva, N. Y., and Isaac M. Sullivan, Springfield, O., are the incorporators.

The S. & S Variable Speed Gear Co., New York City, to manufacture variable speed gearing, etc., has been incorporated. Those interested are: Bartlett G. Young, 34 Gramercy Park; C. D. Francis, 60 Wall street; Robert E. Bond, 30 West Forty-fourth street, all of New York. The company is capitalized at $20,000.

Articles of incorporation have been filed by R. W. Jefferies, Franklin Walton and J. F. Tobin, of Camden, N. J., who have organized the R. W. Jefferies Co., with a capital of $100,000. The company will manufacture metal lockers, cabinets, etc., and have its plant at Seventh and Pearl streets, Camden.

A charter has been granted the Requa Coles Co., of New York City, to manufacture improved steering gear for automobiles, and other devices, with a capital stock of $100,000. Leonard F. Requa, 627 West Ninth street, New York; David H. Coles, 11 McDonough street, Brooklyn; and Phillip Van Alstyne, Spring Valley, N. Y., are among the incorporators.

The Cody-Miller Co. has been organized at Brooklyn, N. Y., to manufacture metal articles, supplies for plumbing, etc., with a capital of $20,000, and has been incorporated by the following: Thomas McKeon, 882 Lexington avenue, New York; Irving W. White, 425 West Twenty-second street, New York; and John T. E. Van Derveer, 9 Taylor avenue, The Bronx.

The Simpson Mfg. Co., to manufacture and place on the market automatic vending machines, has been organized at Columbus, O., and has these incorporators: Robert D. Simpson, H. M. Sims, W. T. Wells, B. D. Simpson and E. H. Olim. Capital stock, $5,000.

Articles of incorporation have been filled by the Orvis Economy Furnace Co., New York City, to manufacture boiler furnace appliances and devices for eliminating smoke. Those interested in the new enterprise are Orland D. Orvis, 115 West Ninety-sixth street; Joseph A. Prout, 350 West Twenty-

eighth street; John E. Claffy, 34 East Forty-fifth street; Harry Wilber, 430 West 118th street, all of New York City. Capital stock, $500,000.

The American Pneumatic Hub Wheel Co., with a capital of $50,000, was incorporated at Washington, D. C., several well known bankers of that city being among the incorporators. The officers named in the charter are: George Howard, president; A. H. Collins, vice president and general manager; Thomas W. Owens, second vice president and treasurer; and Murray Cobb, secretary. The company has purchased the patent rights to an invention of a new automobile, is now looking for a site, and will erect a plant as soon as a satisfactory location can be procured.

The Bergstrom Stove Co., Neenah, Wis., has been incorporated with $125,000 capital by George O. Bergstrom, C. H. Bergstrom and J. W. Bergstrom.

The Spring Motor Fan Co., St. Louis, Mo., has been chartered by Herman O. Engelke, Edgar E. Engelke and Edward H. Ross. The capital stock is $50,000, fully paid.

The C. W. Smith Elevator Co., capital $25,000, has been incorporated by C. W. and M. E. Smith, of Buffalo, and Frank L. Barnet, of Alden, N. Y.

With a capital of $10,000, the Guion Stove & Mfg. Co., Guion, Ark., has been incorporated to manufacture and sell stoves, etc. Those interested are: F. L. Staffell, J. H. Kitchens and J. M. Woods.

The Auten Machinery Co., Alton, Ill., to manufacture and deal in agricultural implements, has these incorporators: Aaron O Auten, B. M. Bevington and W. A. Gray. The company has a capital of $20,000.

The National Cornice & Ceiling Co. has been organized at Cleveland, with $10,000 capital. Philip Ettinger, Alexander Laks, Harry Ettinger, C. C. Hyland and R. D. Morgan are the incorporators.

The Pierce Safety Appliance Mfg. Co., with a capital stock of $500,000, has these incorporators: Franklin A. Pierce, of Wheeling; John E. Oswald, of Bellaire; William McSwain, of Moundsville, and Earl A. Lenkard, of Wheeling, W. Va.

Articles of incorporation were filed for the Pittsburg Welding Co., $10,000 capital, through Treasurer George Best, 5504 Hayes street, and the following directors: Charles Ealy, Homestead, Pa.; Harry J. Graham and William M. Hall, Pittsburg, Pa.

The Syracuse Stamping Co., Syracuse, N. Y., has filed articles of incorporation through Charles H. Miller, Harry F. Miller, Rochester, N. Y., and George C. Mumford, of Syracuse. The company is capitalized at $20,000, and was organized to manufacture hardware supplies.

A charter has been granted the Chicago Woodworking Machinery Co., 134 Monroe street, Chicago, to manufacture mill supplies and machinery of all kinds, with capital stock of $5,000. The incorporators are Anton Zeiman, John C. Farwell and George H. Murphy.

The Acetylene Welding Co., New York City, to weld and cut metals by oxy-acetylene process, capital $12,000, has these incorporators: Edward A. Miller and Frank E. Campbell, 241 West Twenty-third street; Joseph P. Coples, 2738 Eighth avenue, all of New York City.

The Union Saw Co., Williamsport, Pa., with a capital stock of $25,000, has been incorporated with these officers and directors: Treasurer, Leroy E. Wilson, Williamsport, Pa. Directors: Eugene W. Wilson, Christopher J. Schad, Leroy E. Wilson, William Doenges and Charles Hays, all of Williamsport, Pa.

K. L. Franklin, 115 Broadway, New York City; R. M. Libby, 42 Broadway; Louis Rosenberg, 50 Pine street, and others, have incorporated the Enameled Steel Construction Co., New York City, with a capital stock of $200,000. The company will manufacture enameled wares on sheet and other metals.

New Construction:—

The building of the Scott Stove & Furnace Co., Cambridge City, Ind., is almost completed, a large force of carpenters being at work. Equipment has been purchased and will be installed rapidly.

A substantial iron addition has been commenced at the Oak street plant of the United Engineering & Foundry Co, Youngstown, O. The frame work is already completed. The new owner has spent considerable money on the plant since it was secured from the Mahoning Foundry Co.

The Campbell Mfg. Co., Gadsden, Ala., has let the contract for the erection of the cupola for the new plant to M. Connolly, of that city. The work is to be completed in 30 days. The contract for the buildings has been let to Litson & Amberson. The main building will be 150 x 250 feet.

Additions doubling the size and capacity of the mining and machinery department of the Jeffrey Mfg. Co., Columbus, O., are being completed and machinery is being placed in the principal new building. With its completion, the Jeffrey company will have one of the finest plants in the country for the manufacure of mining specialties.

The Buettner-Shelburne Machine Co. will start at once moving machinery and material from Sullivan, Ind., to Terre Haute, where the new plant will be running by April 1. The buildings at Terre Haute have been ready for the company since Jan. 1, but up to this time, the company has been so rushed with orders that it has not had time to move.

Plans for a foundry in addition to the present machine plant have been completed by the Yakima Iron Works, North Yakima, Wash. The company has invested in the foundry and new machinery ordered about $20,000. The line of work which the company handles includes heavy forging iron and brass castings, machine work, and the manufacture of drilling machines.

Improvements at the Erie railroad shops at Mosier, O., are again in progress. They include an addition to the rear of the round house; a new power and boiler plant, and a 75-foot addition to the machine shops. When the additions are completed, the Erie shops at Mosier will be one of the principal car repair centers along its lines.

The American Foundry & Construction Co. has extensive plans under way for improvements to its plant at Hazelwood, Pa., which will more than double the output. A steel building, which will contain equipment for bending, welding and cutting pipe has been contracted for, and the foundry will also be enlarged. It is expected to complete the improvements within three months.

The new plant of the Southern Skein & Foundry Co., Chattanooga, Tenn., upon which contractors have been working for some months, has been completed. The building is constructed of stone and brick and is one of the finest manufacturing structures in Tennessee. The work of installing machinery has not yet been finished.

General Industrial.—

The Youngstown Furnace & Supply Co., Youngstown, O., has increased its capital stock to $150,000, from $50,000.

An increase in capital stock from $75,000 to $225,000 has been made by the F. Witte Iron Works, Kansas City, Mo.

The name of the John Wishart Machine Works, Chicago, Ill., has been changed to the Wishart-Burge Machine Works.

The Standard Bridge Co., Red Oak, Ia., builder of bridges and metal contractor, announces that it will not build the proposed addition to its plant this year.

The Master Sheet Metal Workers, Inc., Hartford, Conn., has filed articles of incorporation through Frank H. Whipple, Josephine E. Murray, Edward J. Beseman and Felix Lyon.

The Crescent Machine Co., Chicago, has leased floor space at South Bend, Ind., and is moving its equipment there. The company is engaged in the manufacture of dies and tools.

The Nova Scotia Steel & Iron Co., New Glasgow, N. S., has announced a reduction of 10 per cent in the wages of all employes, it being the first Canadian industrial concern to make a general reduction.

The Allegheny Foundry Co., Ltd., Allegheny, Pa., manufacturer of sash weights and cast iron washers, announces that the fire of the 19th inst. did not do enough damage to its plant to necessitate making any change in buildings.

The T. E. Bissell Co., Ltd., Elora, Ont., recently incorporated, will continue the business heretofore carried on by Mr. Bissell as an individual undertaking. The buildings, plant and equipment of the original firm will be retained.

The Pueblo Foundry Co., recently incorporated, will consolidate with the Collins Burgie Stove Co., Marengo, Ill., and the two concerns will occupy the same building at Pueblo, Col. The consolidated concerns will be incorporated for $250,000.

Notice has been given that the articles of incorporation of the Des Moines Bridge & Iron Works, Des Moines, Ia., have been amended, raising the capital stock to $375,000, $50,000 of which is preferred stock and the remainder common stock.

Stockholders of the E. H. Mumford Co., Philadelphia, manufacturer of foundry machinery, met March 23 to consider increasing the capital stock from $30,000 to $200,000. Under the plan of increase, $65,000 of preferred and $135,000 common stock will be issued.

The Southern Foundry Co., Owensboro, Ky., has amended its original articles of incorporation by providing an increase of $25,000 in the capital stock. The increase will be preferred stock, making the total preferred stock of the concern $40,000, and common stock $85,000.

The Clinton Machinery Co., Clinton, Ont., has been placed in the hands of Osler Wade, Toronto, who has been appinted interim liquidator by the courts. According to the last balance sheet, the company had assets amounting to $91,000, and liabilities $84,000.

According to the recent court decision, all the books of the Oswego Boiler & Engine Co., Oswego, N. Y., must be turned over to Receiver Charles A. Bentley. Attorneys for the company made a contest to hold back the records of the firm, which, they declare, is solvent.

The Joliet Steel Construction Co., Joliet, Ill., has been awarded the contract for the erection of a steel auditorium at Kansas City, Mo. This is one of the umbrella style of buildings original with the company, such as it has erected at Plainfield, Aurora and various other cities.

The annual meeting of the stockholders of the Meadville Malleable Iron Co., Meadville, Pa., was held March 4, when the following officers were elected: President, J. McK. Speer; vice president, John E. Reynolds; treasurer and general manager, L. L. Lord; secretary P. W. Kaufman. The report of the year 1907 shows that it was the most prosperous year since the company has been in business.

Representatives of the iron industries in Ironton, Ashland, Wellston, and other Ohio River cities, had a recent meeting with the freight officials of the Chesapeake & Ohio railroad to discuss freight rates. The iron manufacturers want a lower rate from their cities to all points of shipment on the C. & O. railroad. Another meeting will be held in the near future, as no conclusion was reached at the last conference.

At the meeting of the creditors of the Quinn Furnace Co., at Anniston, Ala., March 16, Joseph W. Balfour and J. W. Hammond, of Attalla, Ala., were named trustees of the property. As soon as their bond has been approved, it is the intention of the trustees to put the property in operation. The material now on hand, if made into finished product, will, it is believed, take care of the claims of the creditors in full.

Trade Notes:—

The management of the Weber Steel Concrete Chimney Co., Chicago, announces that owing to the company increasing its field of activity in taking on other kinds of plain and reinforced concrete work, it has been decided to change the name to the Weber Co., general offices as before, 929-934 Marquette Bldg., Chicago. The Weber Co., now has branch offices in New York, Atlanta, Cincinnati, St. Louis, Houston, Memphis, Minneapolis, Denver, Salt Lake City, Los Angeles, San Francisco and Seattle. Foreign offices have been established at London, Eng.; Paris and Halle, Germany.

The Bethlehem Steel Co. has just completed installing the armor plate safe deposit vaults for the Umboldt Savings bank, San Francisco. The vault is 40 feet long, 10 feet wide and 9 feet high, inside dimensions. It has two circular entrance doors, weighing 20 tons each. It is the first armor plate vault installed on the Pacific coast made by the Bethlehem company at its armor plate mills, South Bethelhem, Pa.

Parker V. P. Dodge, Pittsburg representative of the Youngstown Car Mfg. Co., is now permanently located at 406 House Building, Pittsburg, Pa. The Youngstown Car Mfg. Co. is extensive manufacturer of all kinds of wood and steel cars for industrial service.

Among the corporations who have already leased space and will transfer to the Hudson Terminal Buildings, New York City, about April 15, are General Electric Co., American Bridge Co., Railway Steel Springs Co., American Locomotive Co., United States Steel Export Products Co., American Steel & Wire Co., National Tube Co., Chicago Pneumatic Tool Co., Carnegie Steel Co., Lorain Steel Co., American Brake Shoe & Foundry Co., Crocker-Wheeler Co., American Gas & Electric Co., Chesapeake & Ohio Coal Agency, American Sheet & Tin Plate Co., Carbon Steel Co., National Metal Trade Association, American Clay Machinery Co. and the Providence Engineering Co.

Fires:—

The plant of the Fifield Tool Co., Lowell, Mass., builders of engine lathes and other machinery, was badly damaged March 19. The loss is estimated at $400,000, partly covered by insurance.

The building occupied by the Michigan Iron & Metal Co., Battle Creek, Mich., was seriously damaged March 17. The loss on the building is estimated at $2,000 and on the contents at $10,000.

Fire destroyed the wash room at the Summit Stove Works, Geneva, N. Y., March 17, inflicting damage to the amount of $1,000.

The forge room of the Green Foundry & Furnace Co., Des Moines, Ia., was damaged March 9 to the extent of about $500, covered by insurance.

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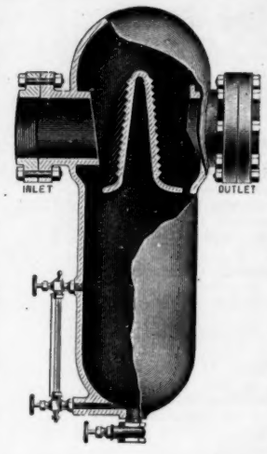

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These Hoists will raise a load of two tons to a height of one foot with a pull of 125 lbs. while overhauling only 39½ feet of hand chain.
As you would have to overhaul at least 90 feet of hand chain to do the same work on the best Screw Hoists, it is plain that the CYCLONE is more than twice as fast. It can be geared to a higher speed than any other hoist with no greater hand wheel pull.
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When there is no load the hand wheel may be spun in either direction.
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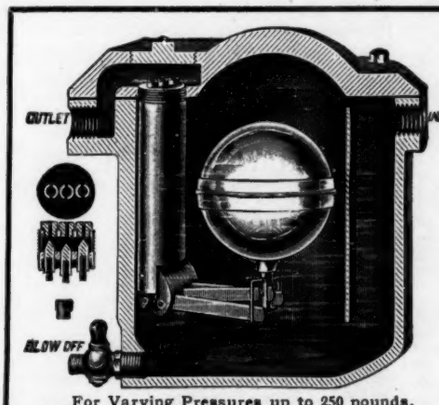

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